

EXHIBIT A

US009936240B2

(12) **United States Patent**
Perez

(10) **Patent No.:** **US 9,936,240 B2**
(45) **Date of Patent:** ***Apr. 3, 2018**

(54) **DYNAMIC ADJUSTMENT OF ELECTRONIC PROGRAM GUIDE DISPLAYS BASED ON VIEWER PREFERENCES FOR MINIMIZING NAVIGATION IN VOD PROGRAM SELECTION**

(58) **Field of Classification Search**
CPC H04N 21/482; H04N 21/2547; H04N 21/25891; H04N 21/2443; H04N 21/4312;
(Continued)

(71) Applicant: **Broadband iTV, Inc.**, Honolulu, HI (US)

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,706,121 A 11/1987 Young
4,751,578 A 6/1988 Reiter et al.
(Continued)

FOREIGN PATENT DOCUMENTS

EP 1 164 796 A1 12/2001
EP 1 361 759 A1 11/2003
(Continued)

OTHER PUBLICATIONS

International Search Report, dated Mar. 6, 2006, in PCT International Application US2005/027376, of Broadband iTV, Inc.

(Continued)

(72) Inventor: **Milton Diaz Perez**, Tiburon, CA (US)

(73) Assignee: **Broadband iTV, Inc.**, Honolulu, HI (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **15/582,099**

(22) Filed: **Apr. 28, 2017**

(65) **Prior Publication Data**

US 2017/0238035 A1 Aug. 17, 2017

Related U.S. Application Data

(60) Continuation of application No. 15/002,011, filed on Jan. 20, 2016, now Pat. No. 9,641,902, which is a (Continued)

(51) **Int. Cl.**
G06F 3/00 (2006.01)
G06F 13/00 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC **H04N 21/25891** (2013.01); **H04N 21/251** (2013.01); **H04N 21/2541** (2013.01);
(Continued)

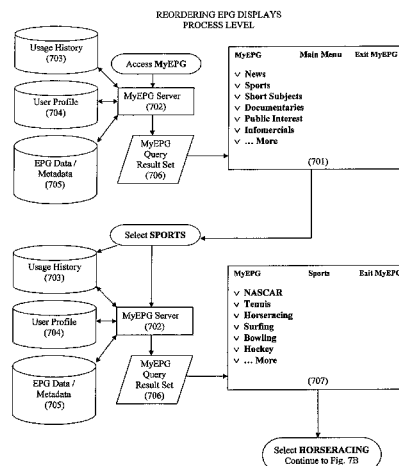
Primary Examiner — Yassin Alata

(74) *Attorney, Agent, or Firm* — Amster, Rothstein & Ebenstein LLP

(57) **ABSTRACT**

Items of video content offered for viewing on a video-on-demand (VOD) platform of a digital TV service provider are each assigned a respective title and hierarchical address corresponding to hierarchically-arranged categories and subcategories within which the title for the video content is to be categorized. The title is listed in a location of an electronic program guide (EPG) using the same categories and subcategories as its hierarchical address. Any TV subscriber can access the EPG and navigate through its categories and subcategories to find a title for viewing on the TV. The EPG dynamically adjust its display listings of each level of categories, subcategories, and titles in order to minimize the number of remote control keypresses needed for a

(Continued)



US 9,936,240 B2

Page 2

viewer to navigate to a title of interest. In one basic form, the EPG display is reordered by listing more frequently visited categories or subcategories first, and other less frequently visited categories or subcategories lower on the listing or out-of-sight on another page of the display.

15 Claims, 16 Drawing Sheets

Related U.S. Application Data

continuation of application No. 12/869,534, filed on Aug. 26, 2010, now Pat. No. 9,344,765, which is a division of application No. 11/768,895, filed on Jun. 26, 2007, now Pat. No. 9,584,868.

(51) Int. Cl.

H04N 5/445 (2011.01)
H04N 21/258 (2011.01)
H04N 21/25 (2011.01)
H04N 21/254 (2011.01)
H04N 21/422 (2011.01)
H04N 21/431 (2011.01)
H04N 21/45 (2011.01)
H04N 21/4627 (2011.01)
H04N 21/466 (2011.01)
H04N 21/472 (2011.01)
H04N 21/475 (2011.01)
H04N 21/482 (2011.01)
H04N 21/61 (2011.01)
H04N 21/858 (2011.01)

(52) U.S. Cl.

CPC ... *H04N 21/42204* (2013.01); *H04N 21/4312* (2013.01); *H04N 21/4532* (2013.01); *H04N 21/4627* (2013.01); *H04N 21/4668* (2013.01); *H04N 21/4753* (2013.01); *H04N 21/47202* (2013.01); *H04N 21/4826* (2013.01); *H04N 21/6125* (2013.01); *H04N 21/8586* (2013.01)

(58) Field of Classification Search

CPC *H04N 21/4314*; *H04N 21/47202*; *H04N 21/4722*; *H04N 21/812*; *H04N 21/84*; *H04N 21/858*

See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

5,479,268 A 12/1995 Young et al.
 5,485,219 A 1/1996 Woo
 5,550,735 A 8/1996 Slade et al.
 5,559,549 A 9/1996 Hendricks et al.
 5,566,287 A 10/1996 Delpuch
 5,589,892 A 12/1996 Knee et al.
 5,592,551 A 1/1997 Lett et al.
 5,594,936 A 1/1997 Rebec et al.
 5,616,876 A 4/1997 Cluts
 5,648,824 A 7/1997 Dunn et al.
 5,670,730 A 9/1997 Grewe et al.
 5,686,954 A 11/1997 Yoshinobu et al.
 5,689,799 A 11/1997 Dougherty et al.
 5,699,125 A 12/1997 Rzeszewski et al.
 5,701,161 A 12/1997 Williams et al.
 5,721,827 A 2/1998 Logan et al.
 5,734,853 A 3/1998 Hendricks et al.
 5,739,451 A 4/1998 Winsky et al.
 5,758,258 A 5/1998 Shoff et al.
 5,759,101 A 6/1998 Von Kohorn
 5,778,181 A 7/1998 Hidary et al.

5,790,176 A 8/1998 Craig
 5,790,935 A 8/1998 Payton
 5,798,785 A 8/1998 Hendricks et al.
 5,798,921 A 8/1998 Johnson et al.
 5,805,763 A 9/1998 Lawler et al.
 5,812,123 A 9/1998 Rowe et al.
 5,813,014 A 9/1998 Gustman
 5,822,123 A 10/1998 Davis et al.
 5,826,102 A 10/1998 Escobar
 5,832,499 A 11/1998 Gustman
 5,850,218 A 12/1998 LaJoie et al.
 5,859,898 A 1/1999 Checco
 5,867,821 A 2/1999 Ballantyne
 5,884,033 A 3/1999 Duvall et al.
 5,892,536 A 4/1999 Logan et al.
 5,914,746 A 6/1999 Matthews
 5,918,303 A 6/1999 Yamaura et al.
 5,926,230 A 7/1999 Nijima et al.
 5,931,901 A 8/1999 Wolfe
 5,956,716 A 9/1999 Kenner et al.
 5,969,283 A 10/1999 Looney et al.
 5,991,801 A 11/1999 Rebec et al.
 6,005,561 A 12/1999 Hawkins et al.
 6,008,803 A 12/1999 Rowe et al.
 6,018,768 A 1/2000 Ullman et al.
 6,025,837 A 2/2000 Matthews et al.
 6,029,045 A 2/2000 Picco et al.
 6,038,591 A 3/2000 Wolfe
 6,049,823 A 4/2000 Hwang
 6,062,868 A 5/2000 Toriumi
 6,088,455 A 7/2000 Logan et al.
 6,092,080 A 7/2000 Gustman
 6,100,883 A 8/2000 Hoarty
 6,118,442 A 9/2000 Tanigawa
 6,118,450 A 9/2000 Proehl et al.
 6,128,012 A 10/2000 Seidensticker, Jr. et al.
 6,148,081 A 11/2000 Szymanski et al.
 6,161,142 A 12/2000 Wolfe
 6,163,316 A 12/2000 Killian
 6,172,677 B1 1/2001 Stautner et al.
 6,177,931 B1 1/2001 Alexander et al.
 6,201,538 B1 3/2001 Wugofski
 6,205,582 B1 3/2001 Hoarty
 6,208,799 B1 3/2001 Marsh et al.
 6,233,736 B1 5/2001 Wolzien
 6,237,146 B1 5/2001 Richards
 6,248,946 B1 6/2001 Dwek
 6,269,275 B1 7/2001 Slade
 6,289,346 B1 9/2001 Milewski et al.
 6,305,016 B1 10/2001 Marshall et al.
 6,317,885 B1 11/2001 Fries
 6,332,175 B1 12/2001 Birrell et al.
 6,357,042 B2 3/2002 Srinivasan
 6,377,530 B1 4/2002 Burrows
 6,418,556 B1 7/2002 Bennington et al.
 6,445,398 B1 9/2002 Gerba et al.
 6,446,083 B1 9/2002 Leight et al.
 6,476,826 B1 11/2002 Plotkin et al.
 6,539,548 B1 3/2003 Hendricks et al.
 6,546,393 B1 4/2003 Khan
 6,564,380 B1 5/2003 Murphy
 6,606,746 B1 8/2003 Zdepski et al.
 6,678,463 B1 1/2004 Pierre et al.
 6,738,978 B1 5/2004 Hendricks
 6,754,904 B1 6/2004 Cooper et al.
 6,760,721 B1 7/2004 Chasen et al.
 6,766,100 B1 7/2004 Komar et al.
 6,772,433 B1 8/2004 LaJoie et al.
 6,774,926 B1 8/2004 Ellis et al.
 6,804,825 B1 10/2004 White et al.
 6,834,110 B1 12/2004 Marconoini et al.
 6,845,396 B1 1/2005 Kanojia et al.
 6,898,762 B2 5/2005 Ellis et al.
 6,910,191 B2 6/2005 Segerberg et al.
 6,928,433 B2 8/2005 Goodman et al.
 6,931,451 B1 8/2005 Logan et al.
 6,976,229 B1 12/2005 Balabanovic et al.
 6,985,586 B2 1/2006 Hill
 6,990,677 B1 1/2006 Pietraszak et al.

US 9,936,240 B2

Page 3

(56)

References Cited

U.S. PATENT DOCUMENTS

7,020,888 B2	3/2006	Reynolds et al.	8,112,776 B2	2/2012	Schein et al.
7,028,327 B1	4/2006	Dougherty et al.	8,122,034 B2	2/2012	Aravamudan et al.
7,047,411 B1	5/2006	DeMello et al.	8,151,290 B1	4/2012	Ujihara
7,055,166 B1	5/2006	Logan et al.	8,191,098 B2	5/2012	Cooper et al.
7,055,169 B2	5/2006	Delpuch et al.	8,205,237 B2	6/2012	Cox
7,058,223 B2	6/2006	Cox	8,214,254 B1	7/2012	Mowry
7,065,709 B2	6/2006	Ellis	8,219,446 B1	7/2012	Mowry
7,076,734 B2	7/2006	Wolff et al.	8,249,924 B1	8/2012	Mowry
7,089,309 B2	8/2006	Ramaley et al.	8,281,339 B1	10/2012	Walker et al.
7,100,185 B2	8/2006	Bennington et al.	8,332,268 B2	12/2012	Carruthers et al.
7,103,905 B2	9/2006	Novak	8,340,994 B2	12/2012	Tota et al.
7,103,906 B1	9/2006	Katz et al.	8,346,605 B2	1/2013	Krikorian et al.
7,120,925 B2	10/2006	D'Souza et al.	8,365,230 B2	1/2013	Chane et al.
7,155,674 B2	12/2006	Breen et al.	8,434,118 B2	4/2013	Gonder et al.
7,200,575 B2	4/2007	Hans et al.	8,464,302 B1	6/2013	Liwerant et al.
7,213,005 B2	5/2007	Mourad et al.	8,473,868 B1	6/2013	Kauffman
7,222,163 B1	5/2007	Girouard et al.	8,479,246 B2	7/2013	Hudson et al.
7,225,455 B2	5/2007	Bennington et al.	8,566,871 B2	10/2013	Knowles et al.
7,243,139 B2	7/2007	Ullman et al.	8,621,541 B2	12/2013	Ullman et al.
7,269,854 B2	9/2007	Simmons et al.	8,644,354 B2	2/2014	George et al.
7,277,870 B2	10/2007	Mourad et al.	8,707,354 B1	4/2014	Moreau et al.
7,305,691 B2	12/2007	Cristofalo	8,713,595 B2	4/2014	Lemmons et al.
7,308,413 B1	12/2007	Tota et al.	8,843,978 B2	9/2014	Hardin
7,337,462 B2	2/2008	Dudkiewicz et al.	8,955,029 B2	2/2015	Lewis
7,367,043 B2	4/2008	Dudkiewicz et al.	8,997,136 B2	3/2015	Brooks et al.
7,386,512 B1	6/2008	Allibhoy et al.	9,055,325 B2	6/2015	Gaydou et al.
7,392,532 B2	6/2008	White et al.	9,066,118 B2	6/2015	Diaz Perez
7,409,437 B2	8/2008	Ullman et al.	9,078,016 B2	7/2015	Diaz Perez
7,421,729 B2	9/2008	Zenoni	9,106,959 B2	8/2015	Diaz Perez
7,426,558 B1	9/2008	Allibhoy et al.	9,113,228 B2	8/2015	Diaz Perez
7,444,402 B2	10/2008	Rennels	9,232,275 B2	1/2016	Diaz Perez
7,471,834 B2	12/2008	Sull et al.	9,292,866 B2	3/2016	Allaire et al.
7,490,346 B2	2/2009	Alao et al.	2001/0018771 A1	8/2001	Walker et al.
7,493,643 B2	2/2009	Ellis	2001/0033736 A1	10/2001	Yap
7,516,472 B2	4/2009	Danker et al.	2001/0049625 A1	12/2001	Mowry
7,548,565 B2	6/2009	Sull et al.	2001/0052132 A1	12/2001	Fryer
7,590,997 B2	9/2009	Diaz Perez	2002/0007485 A1	1/2002	Rodriguez et al.
7,594,245 B2	9/2009	Sezan et al.	2002/0042921 A1	4/2002	Ellis
7,596,797 B1	9/2009	Kapner, III et al.	2002/0045960 A1	4/2002	Phillips et al.
7,606,883 B1	10/2009	Allibhoy et al.	2002/0056104 A1	5/2002	Burnhouse et al.
7,624,337 B2	11/2009	Sull et al.	2002/0057892 A1	5/2002	Mano et al.
7,631,336 B2	12/2009	Diaz Perez	2002/0059621 A1	5/2002	Thomas et al.
7,644,429 B2	1/2010	Bayassi et al.	2002/0066106 A1	5/2002	Kanojia et al.
7,650,621 B2	1/2010	Thomas et al.	2002/0069218 A1	6/2002	Sull et al.
7,690,020 B2	3/2010	Lebar	2002/0078456 A1	6/2002	Hudson
7,698,723 B2	4/2010	Hicks, III et al.	2002/0083451 A1	6/2002	Gill
7,720,707 B1	5/2010	Mowry	2002/0087661 A1	7/2002	Matichuk et al.
7,725,740 B2	5/2010	Kudelski et al.	2002/0088009 A1	7/2002	Dudkiewicz et al.
7,761,899 B2	7/2010	Buehl et al.	2002/0088010 A1	7/2002	Dudkiewicz et al.
7,774,819 B2	8/2010	Diaz Perez	2002/0092019 A1	7/2002	Marcus
7,801,838 B2	9/2010	Colbath et al.	2002/0104099 A1	8/2002	Novak
7,801,910 B2	9/2010	Houh et al.	2002/0120925 A1	8/2002	Logan
7,814,519 B2	10/2010	Rao et al.	2002/0138843 A1	9/2002	Samaan et al.
7,835,920 B2	11/2010	Snyder et al.	2002/0138844 A1	9/2002	Otenasek
7,885,963 B2	2/2011	Sanders	2002/0147975 A1	10/2002	Seo
7,900,229 B2	3/2011	Dureau	2002/0152224 A1	10/2002	Roth et al.
7,908,626 B2	3/2011	Williamson et al.	2002/0152318 A1	10/2002	Menon et al.
7,917,933 B2	3/2011	Thomas et al.	2002/0163532 A1	11/2002	Thomas et al.
7,921,448 B2	4/2011	Fickle et al.	2002/0174430 A1	11/2002	Ellis et al.
7,925,973 B2	4/2011	Allaire et al.	2002/0174433 A1	11/2002	Baumgartner et al.
7,926,079 B2	4/2011	Lebar	2002/0184634 A1	12/2002	Cooper
7,945,929 B2	5/2011	Knudson et al.	2002/0184635 A1	12/2002	Istvan
7,949,722 B1	5/2011	Ullman et al.	2002/0194194 A1	12/2002	Fenton et al.
7,950,033 B2	5/2011	Pierre et al.	2002/0199188 A1	12/2002	Sie et al.
7,962,414 B1	6/2011	Allibhoy et al.	2003/0009542 A1	1/2003	Kasal et al.
7,974,962 B2	7/2011	Krakirian et al.	2003/0016940 A1	1/2003	Robbins
7,987,492 B2	7/2011	Liwerant et al.	2003/0018971 A1	1/2003	McKenna
7,996,861 B1	8/2011	Delpuch	2003/0037010 A1	2/2003	Schmelzer
8,006,263 B2	8/2011	Ellis et al.	2003/0055893 A1	3/2003	Sato et al.
8,010,988 B2	8/2011	Cox	2003/0084126 A1	5/2003	Kumar et al.
8,020,187 B2	9/2011	Cox	2003/0084449 A1	5/2003	Chane et al.
8,042,132 B2	10/2011	Carney et al.	2003/0093790 A1	5/2003	Logan et al.
8,051,450 B2	11/2011	Robarts et al.	2003/0101451 A1	5/2003	Bentolila et al.
8,090,605 B2	1/2012	Tota et al.	2003/0126605 A1	7/2003	Betz et al.
8,107,786 B2	1/2012	Sardera	2003/0149975 A1	8/2003	Eldering et al.
			2003/0149981 A1	8/2003	Finster et al.
			2003/0154128 A1	8/2003	Liga
			2003/0154475 A1	8/2003	Rodriguez et al.
			2003/0163375 A1	8/2003	Dombrowski et al.

US 9,936,240 B2

Page 4

(56)

References Cited

U.S. PATENT DOCUMENTS

2003/0167449 A1 9/2003 Warren
 2003/0167471 A1 9/2003 Roth et al.
 2003/0191816 A1 10/2003 Landress
 2003/0204856 A1 10/2003 Buxton
 2003/0208756 A1 11/2003 Macrae et al.
 2003/0226150 A1 12/2003 Berberet
 2003/0234819 A1 12/2003 Daly
 2004/0015989 A1 1/2004 Kaizu et al.
 2004/0015998 A1 1/2004 Bokor
 2004/0049788 A1 3/2004 Mori et al.
 2004/0073919 A1 4/2004 Gutta et al.
 2004/0078825 A1 4/2004 Murphy
 2004/0103120 A1 5/2004 Fickle et al.
 2004/0117844 A1 6/2004 Karaoguz et al.
 2004/0133918 A1 7/2004 Danker
 2004/0136698 A1 7/2004 Mock
 2004/0148626 A1 7/2004 Sakao et al.
 2004/0158855 A1 8/2004 Gu et al.
 2004/0172419 A1 9/2004 Morris et al.
 2004/0194141 A1 9/2004 Sanders
 2004/0205816 A1 10/2004 Barrett
 2004/0221325 A1 11/2004 Nakajima et al.
 2004/0268250 A1 12/2004 Danker
 2004/0268413 A1 12/2004 Reid et al.
 2005/0044577 A1 2/2005 Jerding
 2005/0049933 A1 3/2005 Upendran et al.
 2005/0050218 A1 3/2005 Sheldon
 2005/0081237 A1 4/2005 Chen
 2005/0097600 A1 5/2005 Heer
 2005/0097622 A1 5/2005 Zigmond et al.
 2005/0097623 A1 5/2005 Tecot
 2005/0129049 A1 6/2005 Srinivasan et al.
 2005/0131837 A1 6/2005 Sanctis et al.
 2005/0138560 A1 6/2005 Lee et al.
 2005/0149987 A1 7/2005 Boccon-Gibod et al.
 2005/0154679 A1 7/2005 Bielak
 2005/0160458 A1 7/2005 Baumgartner
 2005/0160465 A1 7/2005 Walker
 2005/0166230 A1 7/2005 Gaydou et al.
 2005/0188415 A1 8/2005 Riley
 2005/0193015 A1 9/2005 Logston
 2005/0203918 A1 9/2005 Holbrook
 2005/0204388 A1 9/2005 Knudson et al.
 2005/0210524 A1 9/2005 Dolph
 2005/0216941 A1 9/2005 Flanagan et al.
 2005/0229209 A1 10/2005 Hildebolt et al.
 2005/0235318 A1 10/2005 Grauch et al.
 2005/0235319 A1 10/2005 Carpenter et al.
 2005/0239546 A1 10/2005 Hedrick
 2005/0240961 A1 10/2005 Jerding et al.
 2005/0240968 A1 10/2005 Knudson et al.
 2005/0246752 A1 11/2005 Liwerant et al.
 2005/0283800 A1 12/2005 Ellis et al.
 2005/0289151 A1 12/2005 Burke
 2006/0004914 A1 1/2006 Kelly et al.
 2006/0015925 A1 1/2006 Logan
 2006/0029093 A1 2/2006 Van Rossum
 2006/0085830 A1 4/2006 Bruck et al.
 2006/0123455 A1 6/2006 Pai
 2006/0155850 A1 7/2006 Ma et al.
 2006/0174260 A1 8/2006 Gutta
 2006/0267995 A1 11/2006 Radloff et al.
 2006/0287916 A1 12/2006 Starr et al.
 2007/0016530 A1 1/2007 Stasi et al.
 2007/0038567 A1 2/2007 Allaire et al.
 2007/0157221 A1 7/2007 Ou et al.
 2007/0157249 A1 7/2007 Cordray et al.
 2007/0198532 A1 8/2007 Krikorian et al.
 2007/0214482 A1 9/2007 Nguyen
 2007/0245399 A1 10/2007 Espelien
 2007/0250864 A1 10/2007 Diaz Perez
 2007/0277201 A1 11/2007 Wong et al.
 2008/0022298 A1 1/2008 Cavicchia
 2008/0072260 A1 3/2008 Rosin et al.
 2008/0127257 A1 5/2008 Kvache

2008/0141325 A1 6/2008 Ludvig et al.
 2008/0148317 A1 6/2008 Opaluch
 2008/0155613 A1 6/2008 Benya et al.
 2008/0163292 A1 7/2008 Stallworth
 2008/0163330 A1 7/2008 Sparrell
 2008/0189749 A1 8/2008 White et al.
 2008/0222687 A1 9/2008 Edry
 2008/0276277 A1 11/2008 Ahn et al.
 2009/0055868 A1 2/2009 Wehmeyer et al.
 2009/0158334 A1 6/2009 Rodriguez et al.
 2010/0138863 A1 6/2010 Diaz Perez
 2010/0153999 A1 6/2010 Yates
 2010/0175090 A1 7/2010 Cordray
 2010/0211975 A1 8/2010 Boyer et al.
 2010/0319040 A1 12/2010 Diaz Perez
 2010/0325655 A1 12/2010 Diaz Perez
 2011/0030012 A1 2/2011 Diaz Perez
 2011/0030013 A1 2/2011 Diaz Perez
 2011/0166918 A1 7/2011 Allaire et al.
 2011/0191163 A1 8/2011 Allaire et al.
 2013/0125158 A1 5/2013 Brown
 2013/0254804 A1 9/2013 Diaz Perez
 2013/0254809 A1 9/2013 Diaz Perez
 2013/0254814 A1 9/2013 Diaz Perez
 2015/0128192 A1 5/2015 Diaz Perez
 2015/0237403 A1 8/2015 Diaz Perez
 2015/0245099 A1 8/2015 Diaz Perez
 2015/0264440 A1 9/2015 Diaz Perez
 2015/0281792 A1 10/2015 Gaydou et al.
 2015/0358649 A1 12/2015 Diaz Perez
 2015/0358682 A1 12/2015 Diaz Perez
 2015/0358683 A1 12/2015 Diaz Perez

FOREIGN PATENT DOCUMENTS

JP 07-284035 10/1995
 JP 11-150692 6/1999
 JP 03-116121 4/2003
 WO 89/12896 A1 12/1989
 WO 90/15507 A1 12/1990
 WO 9406084 A1 3/1994
 WO 99/10822 A1 3/1999
 WO 99/41684 A1 8/1999
 WO 9950778 A1 10/1999
 WO 01/010124 A1 2/2001
 WO 01/10127 A1 2/2001
 WO WO01022688 3/2001
 WO WO01038960 5/2001
 WO 2002008948 A2 1/2002
 WO 03/052572 A1 6/2003
 WO WO03052572 6/2003
 WO WO03069457 8/2003
 WO 2007/021974 A2 2/2007

OTHER PUBLICATIONS

International Search Report, dated Sep. 15, 2009, in PCT International Application US2008/003341, of Broadband iTV, Inc.
 International Search Report, dated Nov. 28, 2008, in PCT International Application US2008/007980, of Broadband iTV, Inc.
 The Industry Standard, "Web Entertainment Gets Personal", Jan. 10, 2000, www.thestandard.com.
 Affidavit of Milton Diaz Perez Under C.F.R. 132, Mar. 9, 2009, submitted in U.S. Appl. No. 10/909,192, filed Jul. 3, 2004.
 Affidavit of Milton Diaz Perez, Ex. A, Wikipedia, "Cable Television in the United States", history, last modified Jan. 17, 2009, pp. 1-7, http://en.wikipedia.org/wiki/Cable_Television_in_the_United_States.
 Affidavit of Milton Diaz Perez, Ex. B, Wikipedia, "Internet Television", history, last modified Feb. 5, 2009, pp. 1-4, http://en.wikipedia.org/wiki/Internet_TV.
 Affidavit of Milton Diaz Perez, Ex. C, Wikipedia, "Content Delivery Network", history, last modified Feb. 10, 2009, pp. 1-6, http://en.wikipedia.org/wiki/Content_Delivery_Network.
 Affidavit of Milton Diaz Perez, Ex. D, Wikipedia, "Walled Garden (technology)", history, last modified Feb. 3, 2009, pp. 1-2, [http://en.wikipedia.org/wiki/Walled_Garden_\(technology\)](http://en.wikipedia.org/wiki/Walled_Garden_(technology)).

US 9,936,240 B2

Page 5

(56)

References Cited

OTHER PUBLICATIONS

Affidavit of Milton Diaz Perez, Ex. E, Wikipedia, "User-generated TV", history, last modified Feb. 10, 2009, pp. 1-2, http://en.wikipedia.org/wiki/User-generated_TV.

Affidavit of Milton Diaz Perez, Ex. E1, Wikipedia, "ZeD", history, last modified Jan. 5, 2009, pp. 1-7, <http://en.wikipedia.org/wiki/ZeD>.

Affidavit of Milton Diaz Perez, Ex. E2, Wikipedia, "Current TV", history, last modified Feb. 5, 2009, pp. 1-5, http://en.wikipedia.org/wiki/Current_TV.

Affidavit of Milton Diaz Perez, Ex. E3, OUTLOUD.TV, tripatlas, circa 2003, <http://tripatlas.com/Outloud.tv>.

VOD Metadata—Project Primer, Overview of VOD Content Specification 1.0, 1.1, and 2.0, published by Cable Labs, circa 2002-2007, <http://www.cablelabs.com/projects/metadata/primer>.

xOD Capsule, issue dated Apr. 11, 2006, includes article "Bresnan Taps CMC for VOD", published by Communications, Engineering & Design Magazine, <http://www.cedmagazine.com/newsletter.aspx?id=67468>.

Comcast Media Center, Content Gateway, Content Distribution website, circa 2010, <http://www.comcastmediacenter.com/content-gateway>.

Petition for Inter Partes Review, IPR2014-01222, *Unified Patents, Inc. v. Broadband iTV, Inc.*, re U.S. Pat. No. 7,631,336.

Petition for Covered Business Method Review, CBM2014-00189, *Hawaiian Telecom, Inc. v. Broadband iTV, Inc.*, re U.S. Pat. No. 7,631,336.

Patent Owner's Preliminary Response, Jan. 2, 2015, *Hawaiian Telecom, Inc. v. Broadband iTV, Inc.*, re U.S. Pat. No. 7,631,336.

Decision Denying Institution of Inter Partes Review, Jan. 5, 2015, *Unified Patents v. Broadband iTV, Inc.*, re U.S. Pat. No. 7,631,336.

Adams, Open Cable Architecture (Cisco Press 2000), Chapter 8-16.

ATSC Standard: Program and System Information Protocol for Terrestrial Broadcast and Cable (PSIP) (Dec. 23, 1997).

Attack of the \$500 Killer Network Computers: Time-Warner Cable's Full Service Network, Network Computing (Aug. 19, 2000) Internet Archive, <https://web.archive.org/web/20000819050301/http://www.networkcomputing.com/616/616tw.html>.

CableLabs Video-On-Demand Asset Distribution Interface Specification, Version 1.1 (Sep. 27, 2002).

CableLabs Video-On-Demand Content Specification Version 1.1 (Jan. 7, 2004).

Declaration of Milton Diaz Perez, *Broadband iTV, Inc. v. Hawaiian Telecom, Inc. et al.*, No. 14-cv-00169-ACK-KSC (D. Haw. Mar. 2, 2015).

Defendants' Joint Preliminary Invalidity Contentions, *Broadband iTV, Inc. v. Hawaiian Telecom, Inc. et al.*, No. 14-cv-00169-ACK-KSC (D. Haw. Feb. 20, 2015).

Exhibit A, Defendants' Joint Preliminary Invalidity Contentions, *Broadband iTV, Inc. v. Hawaiian Telecom, Inc. et al.*, No. 14-cv-00169-ACK-KSC (D. Haw. Feb. 20, 2015).

Exhibit B, Defendants' Joint Preliminary Invalidity Contentions, *Broadband iTV, Inc. v. Hawaiian Telecom, Inc. et al.*, No. 14-cv-00169-ACK-KSC (D. Haw. Feb. 20, 2015).

Exhibit C, Defendants' Joint Preliminary Invalidity Contentions, *Broadband iTV, Inc. v. Hawaiian Telecom, Inc. et al.*, No. 14-cv-00169-ACK-KSC (D. Haw. Feb. 20, 2015).

Exhibit E, Defendants' Joint Preliminary Invalidity Contentions, *Broadband iTV, Inc. v. Hawaiian Telecom, Inc. et al.*, No. 14-cv-00169-ACK-KSC (D. Haw. Feb. 20, 2015).

Exhibit F, Defendants' Joint Preliminary Invalidity Contentions, *Broadband iTV, Inc. v. Hawaiian Telecom, Inc. et al.*, No. 14-cv-00169-ACK-KSC (D. Haw. Feb. 20, 2015).

Exhibit G, Defendants' Joint Preliminary Invalidity Contentions, *Broadband iTV, Inc. v. Hawaiian Telecom, Inc. et al.*, No. 14-cv-00169-ACK-KSC (D. Haw. Feb. 20, 2015).

Fickle et al., U.S. Appl. No. 60/429,966 (Nov. 27, 2002).

Full Service Network and the Orlando Sentinel add interactive dining guide to GOTv, The Free Library, <http://www.thefreelibrary.com/Full+Service+Network+and+the+Orlando+Sentinel+add+interactive+dining...-a018299720> (published May 20, 1996, last visited Mar. 4, 2015).

Full Service Network(FSN) in Orlando, Florida, Hong Kong University of Science and Technology (May 4, 1997) Internet Archive, <https://web.archive.org/web/19970504203603/http://www.ust.hk/~webiway/content/USA/Trial/fsn.html>.

Full Service Network, Time Warner Cable, <http://m.history.timewarnercable.com/the-twc-story/era-1990-1995/Story.aspx?story=56> (last visited Mar. 4, 2015).

Full Service Network, Wikipedia, http://en.wikipedia.org/w/index.php?title=Full_Service_Network&printable=yes (last visited Mar. 4, 2015).

Tanenbaum, Computer Networks, 4th ed. (Prentice Hall PTR 2003), pp. 1-14.

Time Warner Cable, DRAFT Asset Distribution System ("Catcher's Mitt") Functional Requirements, Version 1.0 (Jan. 26, 2000).

Time Warner Cable, ISA Data Download Delivery, Version 0.5 (Jun. 3, 2004).

Time Warner Cable, Pegasus Interactive Services Architecture, Version 1.4 (Jun. 5, 2003).

Time Warner Cable, The ISA Tutorial, Version 1.0 (Sep. 13, 2003).

Time Warner Cable's Full Service Network connects live to Innoventions, AllBusiness (published Apr. 10, 1996, archived Mar. 25, 2008) Internet Archive, <https://web.archive.org/web/20080325024937/http://www.allbusiness.com/media-telecommunications/telecommunications/7218809-1.html>.

Time Warner introduces world's first full service network in Orlando; Network offers First . . . , AllBusiness (published Dec. 14, 1994, archived May 22, 2009) Internet Archive, <https://web.archive.org/web/2009052214441/http://www.allbusiness.com/media-telecommunications/telecommunications/7087127-1.html>.

Time Warner will close its Full Service Network, Orlando Business Journal, <http://www.bizjournals.com/orlando/stories/1997/04/28/daily7.html> (last visited Mar. 4, 2015).

Time Warner's 'Time Machine' for Future Video, The New York Times, <http://www.nytimes.com/.../12/business/time-warner-s-time-machine-for-future-video.html?pagewanted=28&pagewanted=print> (published Dec. 12, 1994, last visited Mar. 4, 2015).

Time Warner Cable, Request for Proposal and Functional Requirements Specification for Video-On-Demand (VOD) Systems, Version 2.0 (Apr. 25, 1997).

Time Warner Cable, Pegasus Movies On Demand Content Specification, Version 1.3 (Sep. 29, 2000).

Time Warner Cable, Pegasus Overall Flow: Movie Delivery, Version 1.0 (Feb. 18, 2004).

PTAB Decision Denying Institution of Covered Business Method Patent Review, Apr. 1, 2015, *Hawaiian Telecom, Inc. v. Broadband iTV, Inc.*, re U.S. Pat. No. 7,631,336.

TimeWarner, Time Warner Cable Launches Quick Clips, <http://www.timewarner.com/newsroom/press-releases/2006/09/28/time-warner-cable-launches-quick-clips> (published Sep. 28, 2006, last visited Jun. 26, 2015).

Time Warner Cable, Photos & Video Go from Digital Cameras to Television with Free, New Time Warner Cable Product, http://www.timewarnercable.com/en/about-us/press/photos_video_go_fromdigitalcamerastotelevisionwithfreewtimewar.html (published Apr. 27, 2007, last visited Jun. 26, 2015).

Defendants Oceanic Time Warner Cable, LLC and Time Warner Cable Inc.'s Motion for Summary Judgment Regarding Invalidity of U.S. Pat. No. 7,631,336 (ECF 474), *Broadband iTV, Inc. v. Hawaiian Telecom, Inc. et al.*, No. 1:14-cv-00169 (D. Haw. Aug. 10, 2015) (5 pgs).

Memorandum in Support of Defendants Oceanic Time Warner Cable LLC and Time Warner Cable Inc.'s Motion for Summary Judgment Regarding Invalidity of U.S. Pat. No. 7,631,336 (ECF 474-1), *Broadband iTV, Inc. v. Hawaiian Telecom, Inc. et al.*, No. 1:14-cv-00169 (D. Haw. Aug. 10, 2015) (49 pgs).

Concise Statement of Facts in Support of Defendants Oceanic Time Warner Cable LLC and Time Warner Cable Inc.'s Motion for Summary Judgment Regarding Invalidity of U.S. Pat. No.

US 9,936,240 B2

Page 6

(56)

References Cited

OTHER PUBLICATIONS

7,631,336 (ECF 475), *Broadband iTV, Inc. v. Hawaiian Telcom, Inc. et al.*, No. 1:14-cv-00169 (D. Haw. Aug. 10, 2015) (12 pgs).
 Declaration of Nathan L. Brown (ECF 475-1), *Broadband iTV, Inc. v. Hawaiian Telcom, Inc. et al.*, No. 1:14-cv-00169 (D. Haw. Aug. 10, 2015) (6 pgs).
 Exhibits 1 (ECF 475-2), 4 (ECF 475-5), 5 (ECF 475-6), and 6 (ECF 475-7) to Concise Statement of Facts in Support of Defendants Oceanic Time Warner Cable LLC and Time Warner Cable Inc.'s Motion for Summary Judgment Regarding Invalidity of U.S. Patent No. 7,631,336, *Broadband iTV, Inc. v. Hawaiian Telcom, Inc. et al.*, No. 1:14-cv-00169 (D. Haw. Aug. 10, 2015) (133 pgs).
 Plaintiff's Opposition to Defendants Time Warner Cable, Inc. and Oceanic Time Warner Cable, LLC's Motion for Summary Judgment Regarding Invalidity of U.S. Pat. No. 7,631,336 (ECF 561), *Broadband iTV, Inc. v. Hawaiian Telcom, Inc. et al.*, No. 1:14-cv-00169 (D. Haw. Aug. 27, 2015) (52 pgs).
 Plaintiff Broadband iTV, Inc.'s Concise Statement of Facts in Opposition to Defendants Oceanic Time Warner Cable and Time Warner Cable, Inc.'s Concise Statement of Facts (ECF 562), *Broadband iTV, Inc. v. Hawaiian Telcom, Inc. et al.*, No. 1:14-cv-00169 (D. Haw. Aug. 27, 2015) (8 pgs).
 Declaration of Keith A. Jones (ECF 562-1), Inc.'s Concise Statement of Facts, *Broadband iTV, Inc. v. Hawaiian Telcom, Inc. et al.*, No. 1:14-cv-00169 (D. Haw. Aug. 27, 2015) (8 pgs).
 Exhibits 1-10 (ECF 562-2-ECF-11), 12 (ECF 562-13), 14 (ECF 562-15), 16-17 (ECF 562-17-562-18), and 19-20 (ECF 562-20-562-21) to Plaintiff Broadband iTV, Inc.'s Concise Statement of Facts in Opposition to Defendants Oceanic Time Warner Cable and Time Warner Cable, Inc.'s Concise Statement of Facts, *Broadband iTV, Inc. v. Hawaiian Telcom, Inc. et al.*, No. 1:14-cv-00169 (D. Haw. Aug. 27, 2015) (508 pgs).
 Order Granting in Part and Denying in Part Defendants Oceanic Time Warner Cable, LLC and Time Warner Cable, Inc.'s Motion for Summary Judgment Regarding Invalidity of U.S. Pat. No. 7,631,336, *Broadband iTV, Inc. v. Oceanic Time Warner Cable, LLC and Time Warner Cable, Inc.*, No. 15-00131 (D. Haw. Sep. 29, 2015) (77 pgs).
 Judgment, *Broadband iTV, Inc. v. Oceanic Time Warner Cable, LLC and Time Warner Cable, Inc.*, No. 15-00131 (D. Haw. Sep. 29, 2015) (2 pgs).
 Plaintiff's Notice of Appeal; Certificate of Service, *Broadband iTV, Inc. v. Oceanic Time Warner Cable, LLC and Time Warner Cable, Inc.*, No. 15-00131 (D. Haw. Oct. 9, 2015) (4 pgs).
 Order Granting Defendant Hawaiian Telcom, Inc.'s Motion for Summary Judgment of Invalidity Under 35 U.S.C. § 101, *Broad-*

band iTV, Inc. v. Hawaiian Telcom, Inc., No. 14-00169 (D. Haw. Sep. 29, 2015) (43 pgs).
 Judgment, *Broadband iTV, Inc. v. Hawaiian Telcom, Inc.*, No. 14-00169 (D. Haw. Sep. 29, 2015) (2 pgs).
 Plaintiff's Notice of Appeal; Certificate of Service, *Broadband iTV, Inc. v. Hawaiian Telcom, Inc.*, No. 14-00169 (D. Haw. Oct. 9, 2015) (4 pgs).
 Brief of Amici Curiae Broadband iTV, Inc., Double Rock Corporation, Island Intellectual Property, LLC, Access Control Advantage, Inc., and Fairway Financial U.S., Inc. In Support of Appellants, *Netflix, Inc. v. Rovi Corporation et al.*, No. 2015-1917 (Fed. Cir. Dec. 18, 2015).
 Consolidated Brief for Appellant Broadband iTV, Inc., *Broadband iTV, Inc. v. Hawaiian Telcom, Inc. et al.*, No. 16-1082 (Fed. Cir. Jan. 21, 2016).
 Amicus Brief of United Inventors Association of the United States of America in Support of Appellant Broadband iTV, Inc. and Reversal, *Broadband iTV, Inc. v. Hawaiian Telcom, Inc. et al.*, No. 16-1082 (Fed. Cir. Jan. 27, 2016).
 Amicus Brief by Tranxition, Inc., *Broadband iTV, Inc. v. Hawaiian Telcom, Inc. et al.*, No. 16-1082 (Fed. Cir. Jan. 28, 2016).
 EPO Communication for European Application No. 08726793.6, dated May 30, 2016.
 EPO Communication for European Application No. 08768802.4, dated May 30, 2016.
 Notice of Entry of Judgment Without Opinion for Case No. 2016-1082 of the United States Court of Appeals for the Federal Circuit dated Sep. 26, 2016.
 Judgment, *Broadband iTV, Inc. v. Hawaiian Telcom, Inc.*, Oceanic Time Warner Cable, LLC and Time Warner Cable, Inc., Nos. 2016-1082, 2016-1083 (CAFC Sep. 26, 2016) (2 pgs).
 Affidavit of Milton Diaz Perez Under 37 C.F.R. 132, Jan. 20, 2012, submitted in U.S. Appl. No. 11/768,895.
 VDO expands Webcasting possibilities, *Broadcasting & Cable*, Nov. 11, 1996.
 Jose Alvear, "Web Developer.com Guide to Streaming Multimedia", Chapters 9 and 11, 1998.
 Business Wire, "Ivex Announces ViewOps Internet Video Service; Allows Business Managers to View and Manage Operations Online," May 2, 2000.
Broadband iTV, Inc. v. Hawaiian Telcom, Inc. et al.; BBiTV Petition for a Writ of Certiorari (Sup. Ct. Apr. 13, 2017 (No. 16/1241)).
 Order List 581 U.S. Sup. Ct.-Monday, May 22, 2017—*Broadband Itv, Inc. v. Hawaiian Telcom, Inc., et al.*, Petition for Writ of Certiorari Denied (p. 7).
 Ciciora, Farmer, & Large, *Modern Cable Television Technology* (Morgan Kaufmann Publishers, Inc. 1999), 18 pages.
 EPO Communication for European Application No. 05778412.6 dated Feb. 24, 2017.

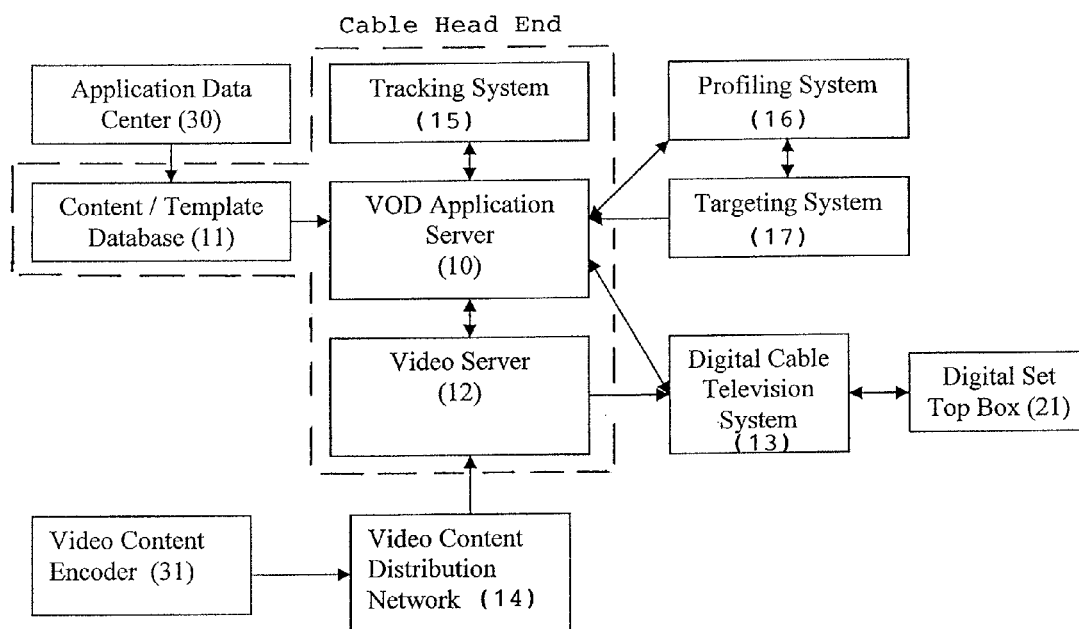


Figure 1A: VOD Content Delivery System, Overall Architecture

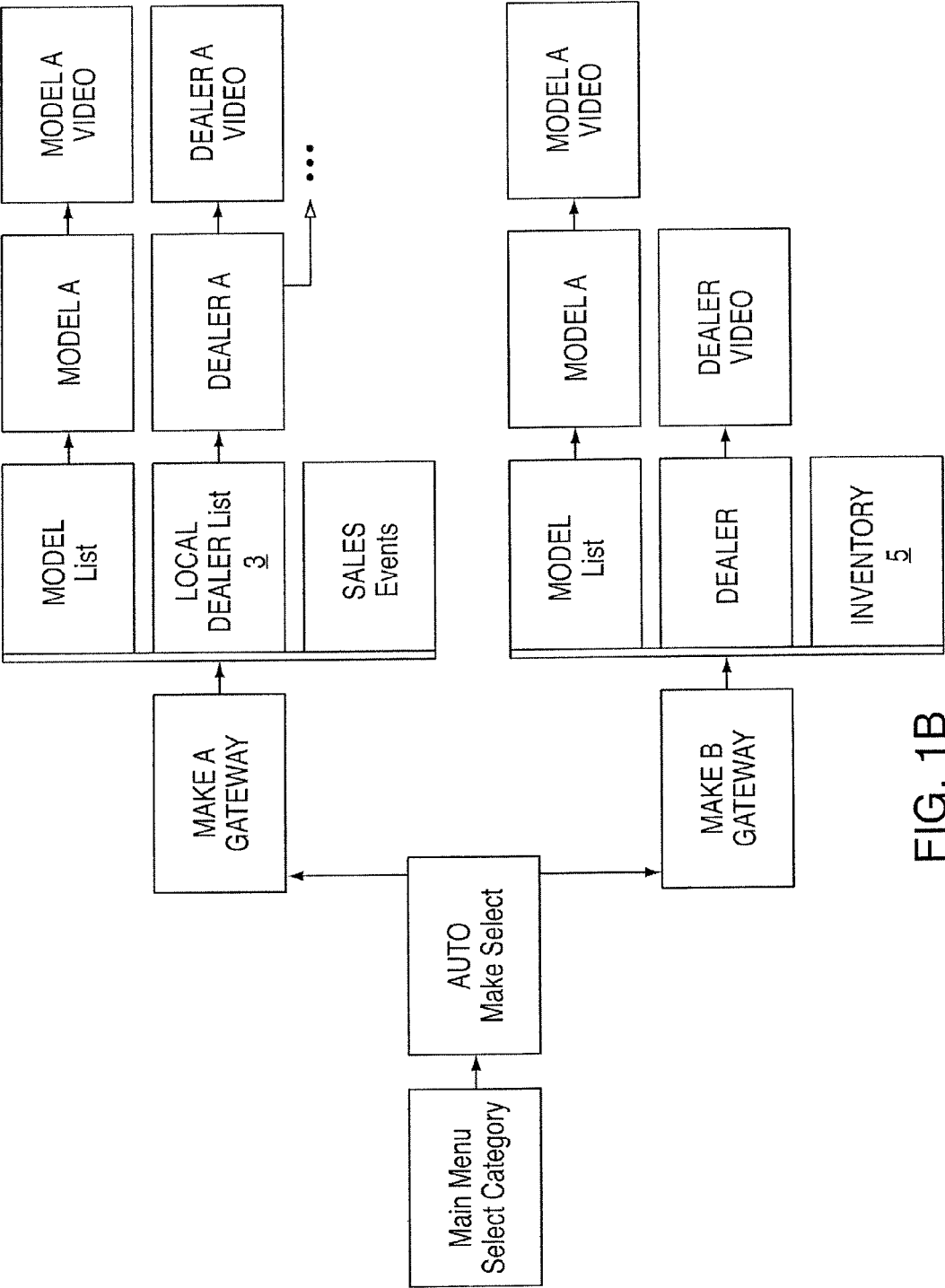


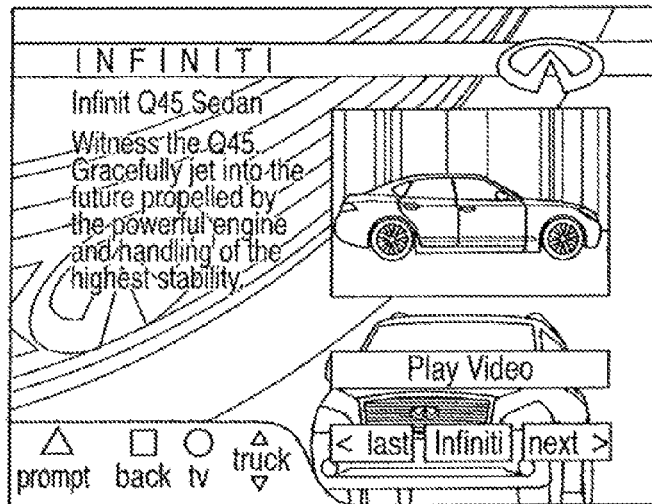
FIG. 1B

U.S. Patent

Apr. 3, 2018

Sheet 3 of 16

US 9,936,240 B2

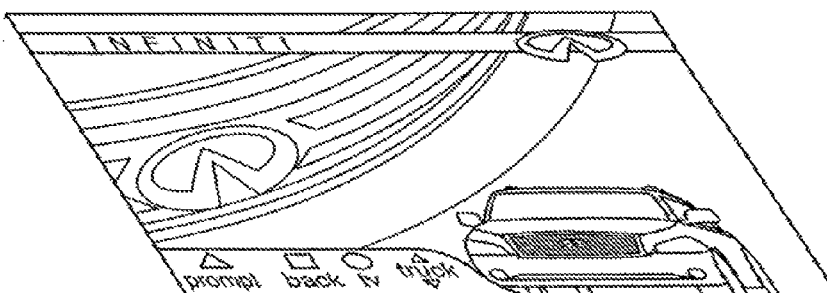
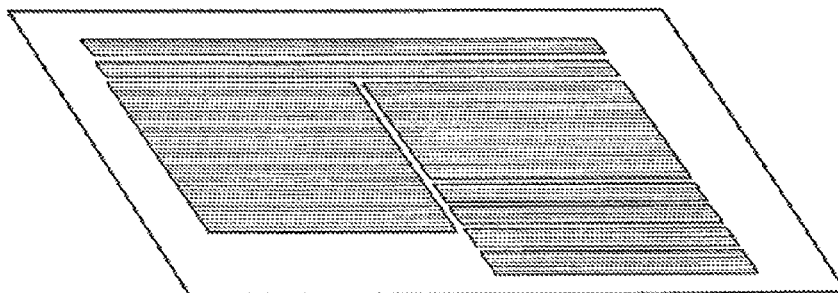


Infiniti Q45 Sedan
 Witness the Q45.
 Gracefully jet into the
 future propelled by
 the powerful engine
 and handling of the
 highest stability.



Play Video
 < last Infiniti next >

FIG. 1C



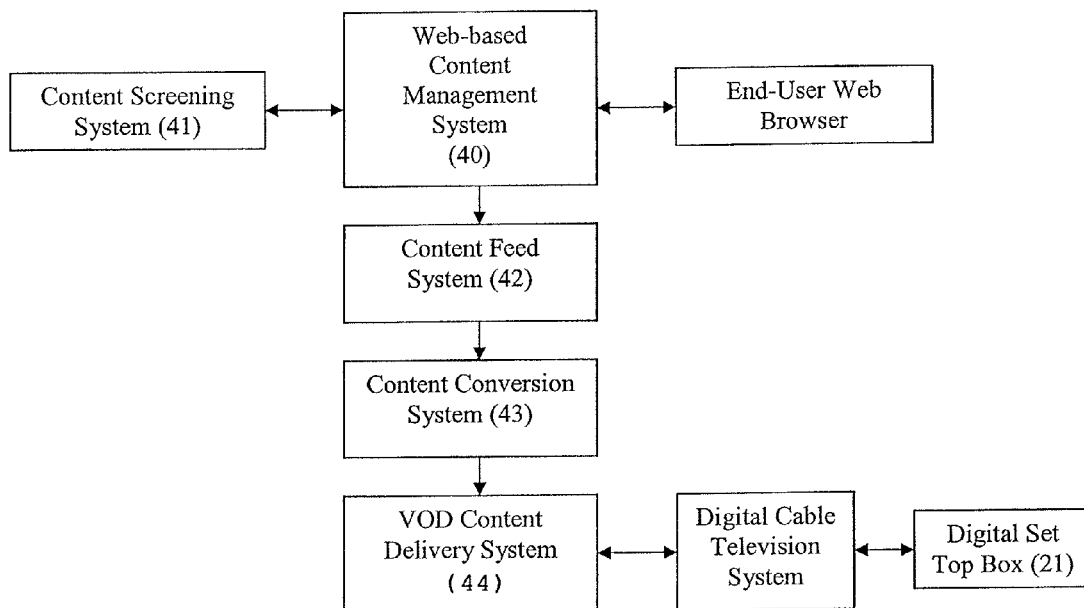


Figure 2A: Classified Ad System, Overall Architecture

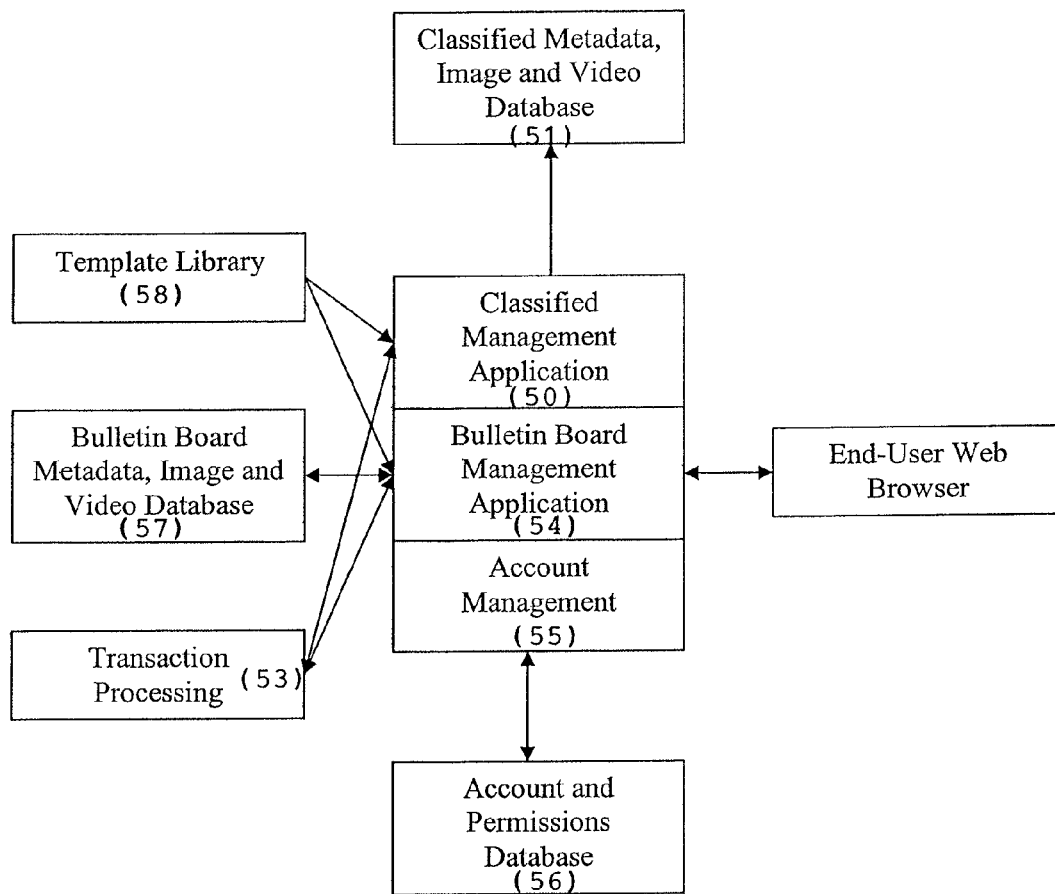


Figure 2B: Web-based Content Management System

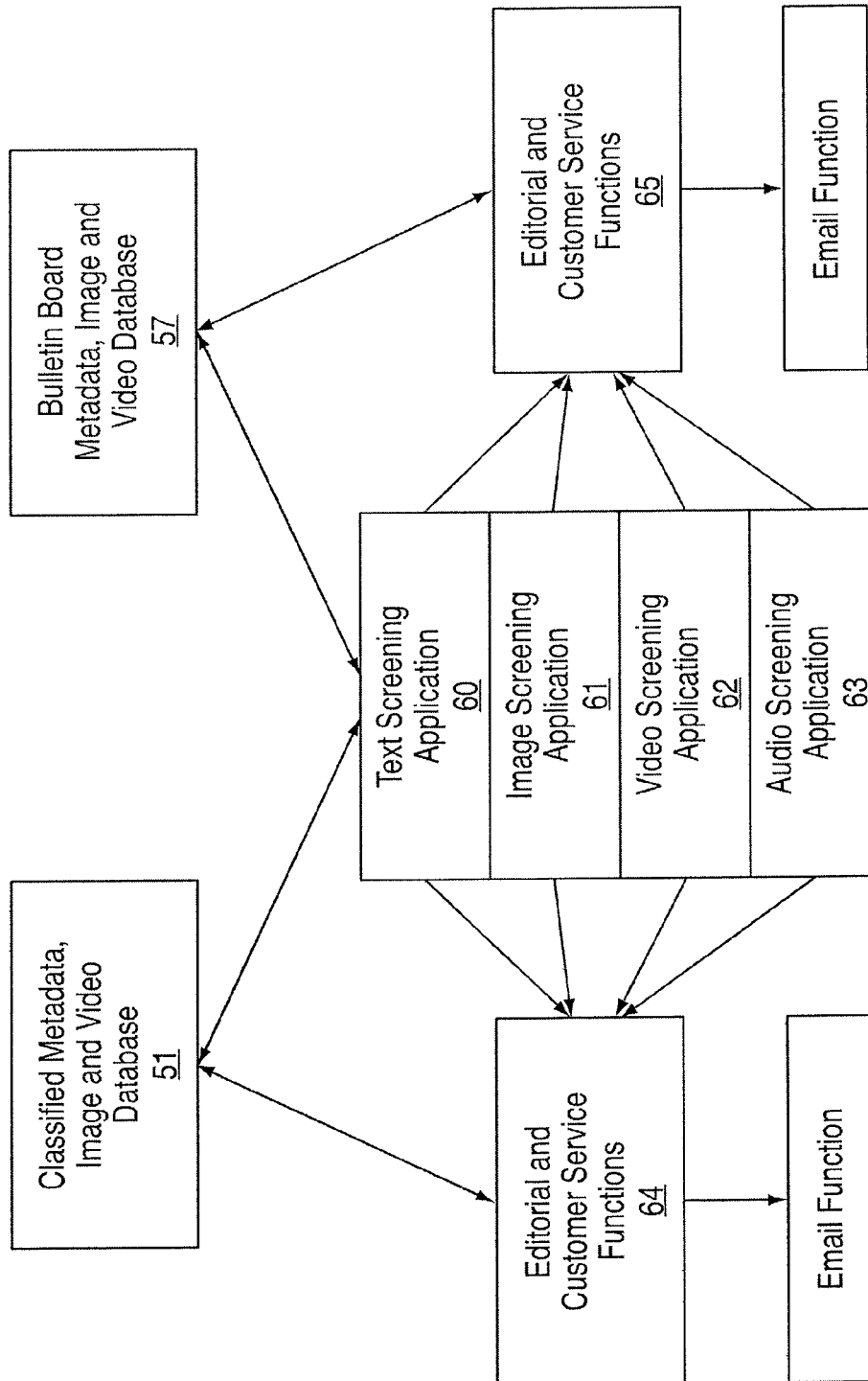


FIG. 2C

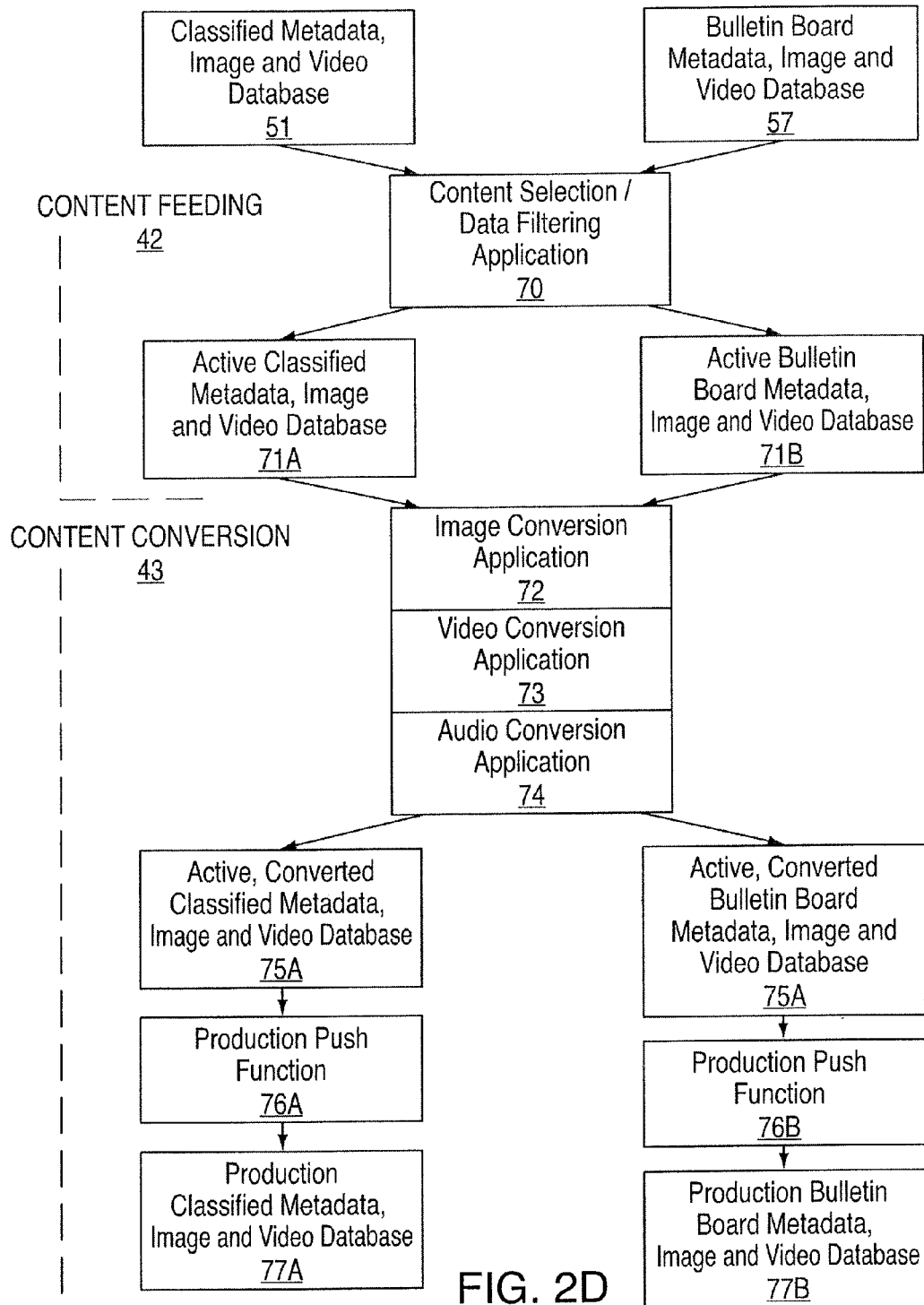


FIG. 2D

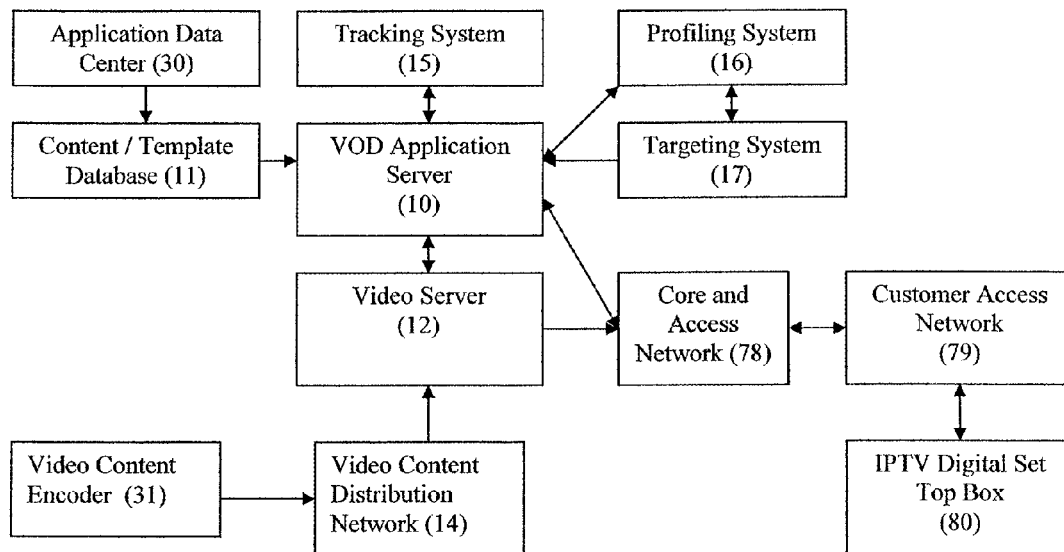


Figure 3: VOD Content Delivery System, Overall Architecture for IPTV System

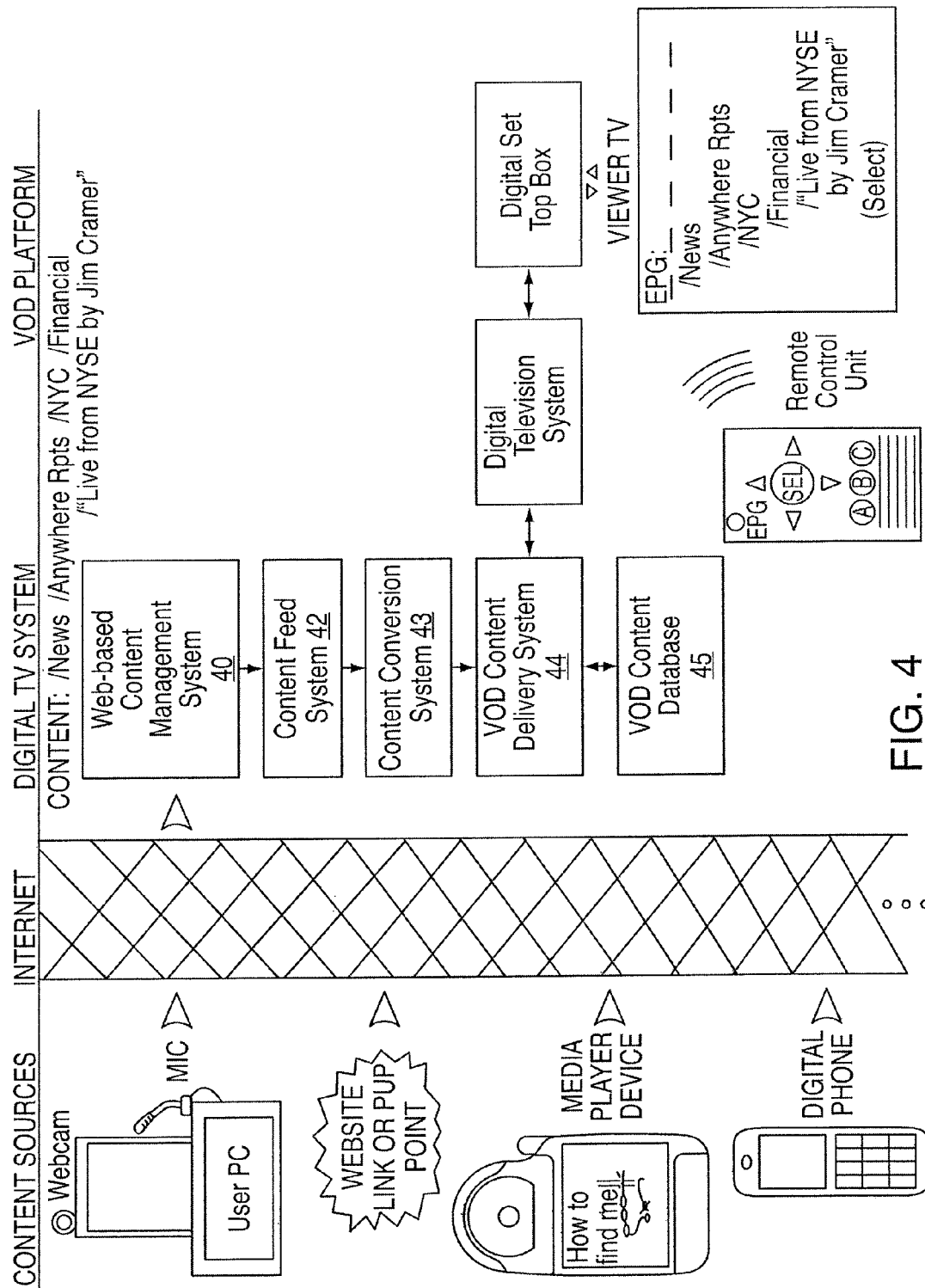


FIG. 4

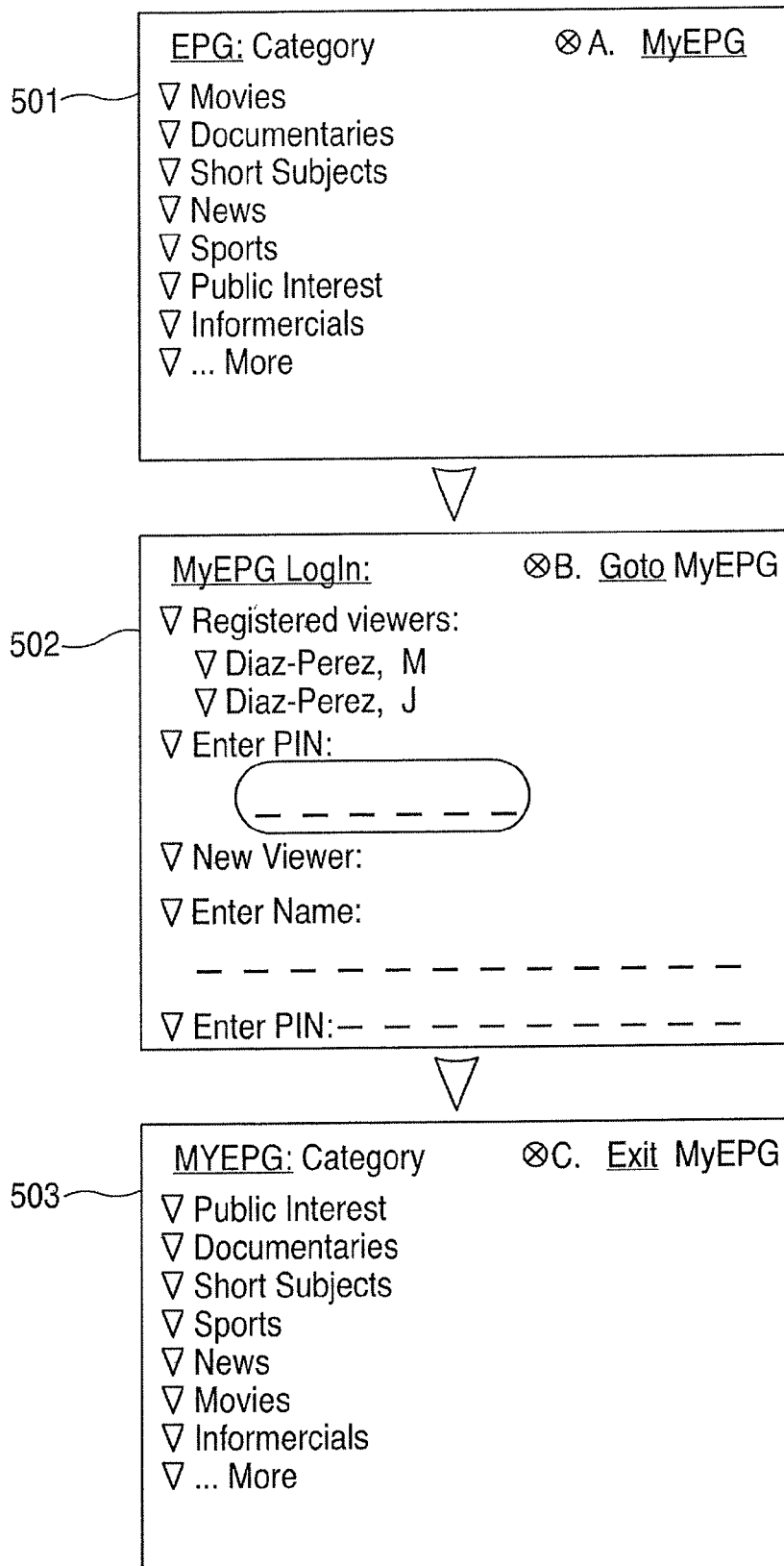


FIG. 5

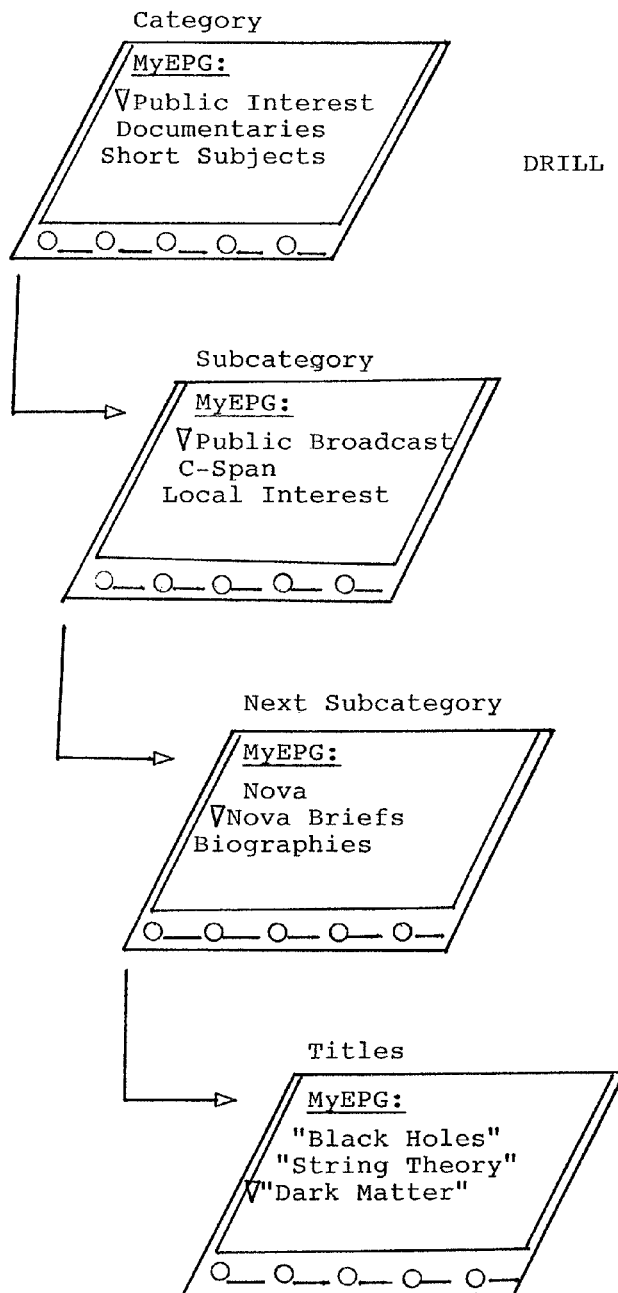


FIG. 6
DRILL DOWN EPG NAVIGATION

Hierarchical Address: /Public Interest/PBS/NovaBriefs/"Dark Matter"

Fig. 7A
REORDERING EPG DISPLAYS
PROCESS LEVEL

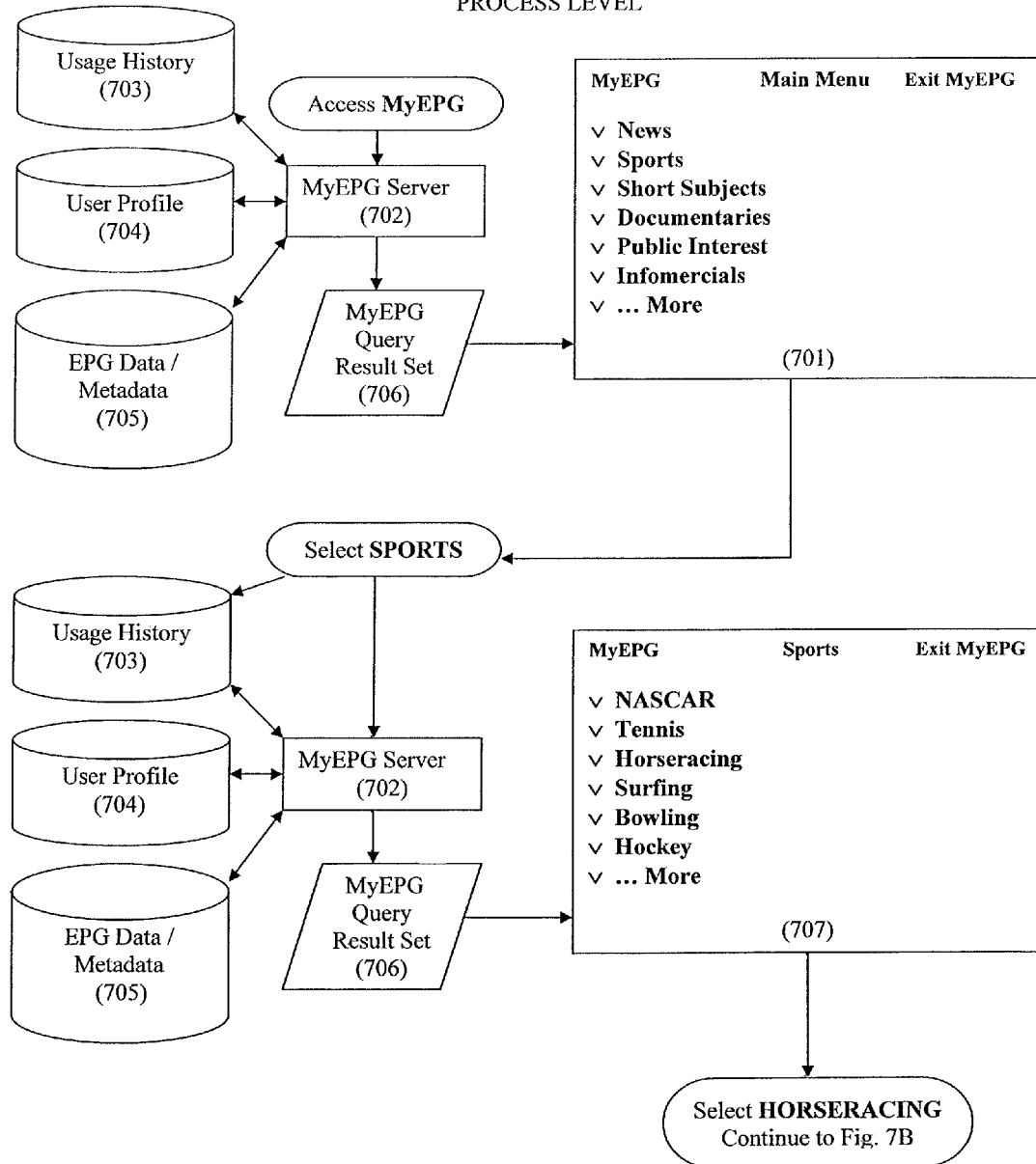


Fig. 7B
REORDERING EPG DISPLAYS
PROCESS LEVEL (cont.)

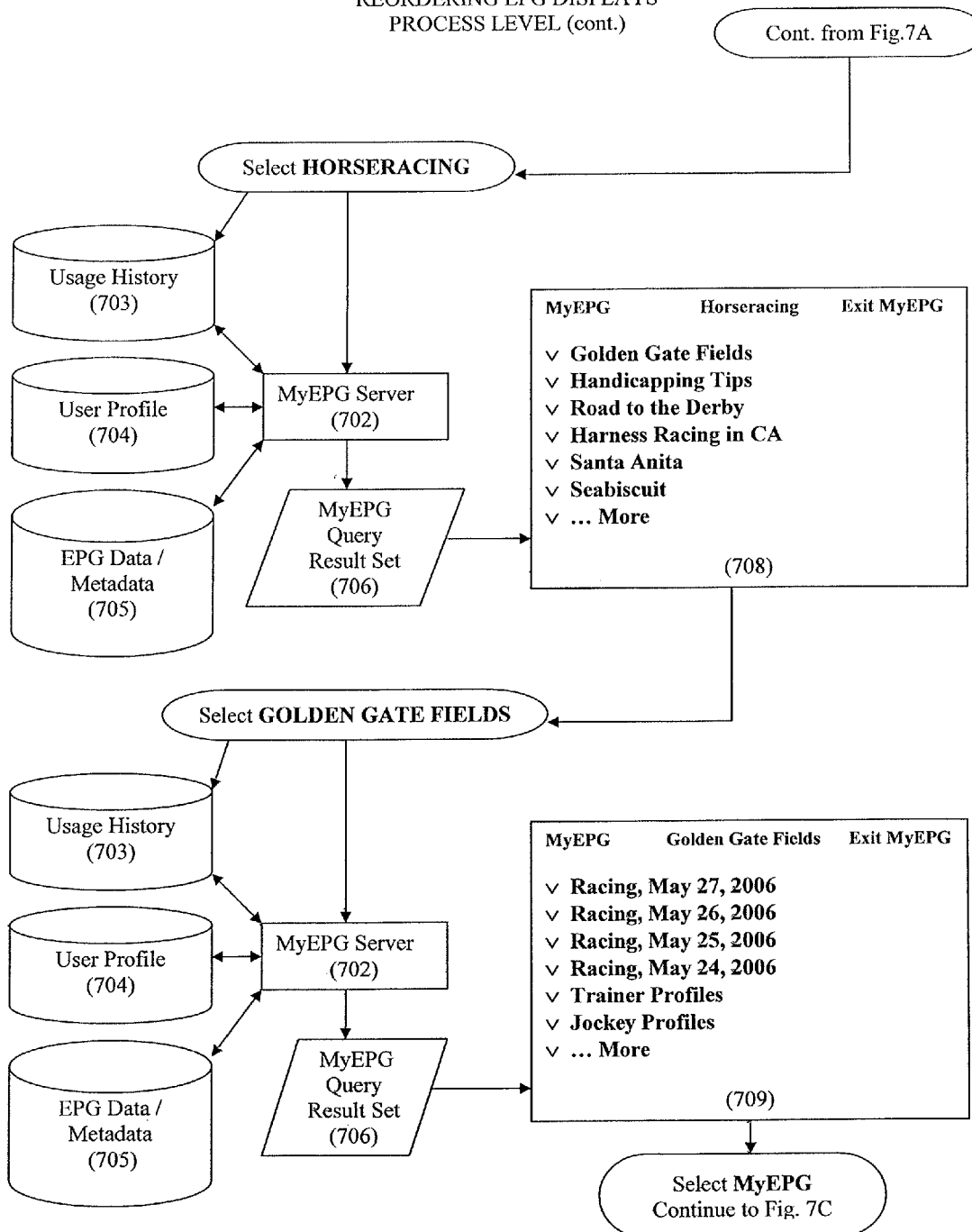


Fig. 7C
REORDERING EPG DISPLAYS
PROCESS LEVEL (cont.)

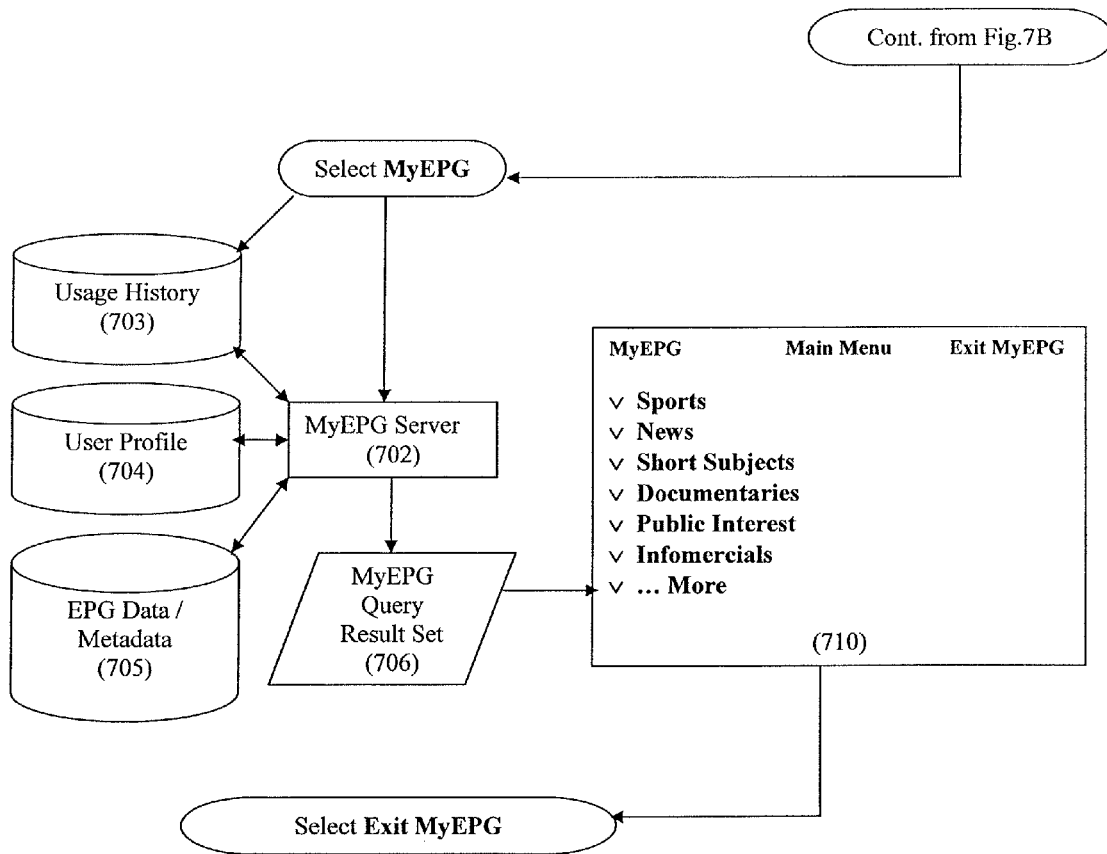


Fig. 8A
MyEPG CATEGORY CREATION

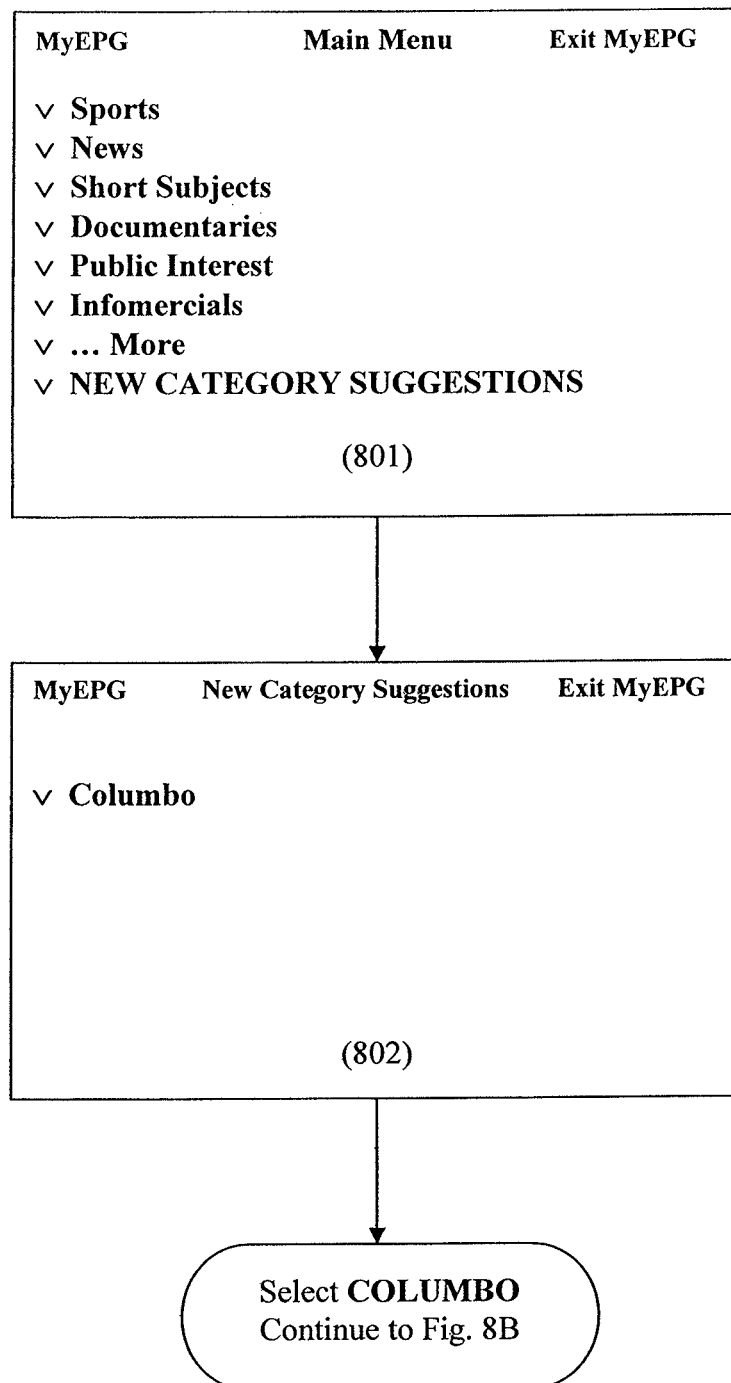


Fig. 8B
MyEPG CATEGORY CREATION

MyEPG	New Category Confirmation	Exit MyEPG
Columbo		
✓ Press 1 to accept new category		
✓ Press 2 to reject new category		
(803)		

MyEPG	Main Menu	Exit MyEPG
✓ Sports		
✓ Columbo		
✓ News		
✓ Short Subjects		
✓ Documentaries		
✓ Public Interest		
✓ ... More		
(804)		

US 9,936,240 B2

1

**DYNAMIC ADJUSTMENT OF ELECTRONIC
PROGRAM GUIDE DISPLAYS BASED ON
VIEWER PREFERENCES FOR MINIMIZING
NAVIGATION IN VOD PROGRAM
SELECTION**

**CROSS-REFERENCE TO RELATED
APPLICATIONS**

This U.S. Patent Application is a continuation application claiming the benefit of co-pending U.S. patent application Ser. No. 15/002,011, filed on Jan. 20, 2016 which was a continuation application claiming the priority of U.S. patent application Ser. No. 12/869,534, filed on Aug. 26, 2010, issued as U.S. Pat. No. 9,344,765 on May 17, 2016, which was a divisional application claiming the priority benefit of U.S. patent application Ser. No. 11/768,895, filed on Jun. 26, 2007, issued as U.S. Pat. No. 9,584,868 on Feb. 28, 2017. This application is further related to U.S. patent application Ser. No. 11/685,188 filed on Mar. 12, 2007, issued as U.S. Pat. No. 7,631,336 on Dec. 8, 2009, and which was a continuation-in-part of U.S. patent application Ser. No. 10/909,192 filed on Jul. 30, 2004, issued as U.S. Pat. No. 7,590,997 on Sep. 15, 2009, all being by the same inventor and incorporated in their entirety by reference as if fully set forth herein.

TECHNICAL FIELD

This invention generally relates to the provision of video content to viewers through digital TV infrastructure, and more particularly, to converting, navigating and displaying video content uploaded from the Internet on a digital TV video-on-demand platform.

BACKGROUND OF INVENTION

Cable television (CATV) systems are used to deliver television services to a vast majority of TV-viewing homes in the U.S. and other technologically advanced countries. The typical CATV system has a cable service provider head end equipped with video servers to transmit CATV program signals through distribution cable lines to local nodes and from there to TV subscriber homes. Within the subscriber homes, the CATV input TV line is connected to one or more customer-premises TVs which are coupled to external set-top boxes for channel tuning or are equipped with internal cable channel tuners. CATV service providers employ the spacious 1 GHz bandwidth of the typical cable (RG-6) line to carry tens of analog TV channels in the portion of the cable bandwidth allocated to analog TV signals. With digital multiplexing methods such as QAM, hundreds of digital TV signals can be carried simultaneously in the portion of the cable bandwidth allocated to digital TV signals. Cable TV service providers have also allocated portions of the cable bandwidth for user (return) data, broadband data connection, and voice-over-IP (VoIP) digital telephone service.

Cable TV service providers generally offer subscribers to subscribe to any of several tiers of bundled TV services on a scale with increasing rates in accordance with signal quality, TV program offerings, and types of interactive services. Digital TV services are offered through advanced digital set-top boxes that are individually addressable from the CATV head end, and also allow subscribers various interactive functions with the CATV head end via inputs to the set-top box via the remote control unit for transmission on the return data path to the CATV head end.

2

A recent type of interactive television service offered on digital TV systems is referred to generally as a “video-on-demand” (VOD) system, wherein a viewer can navigate through a program guide via the remote control unit and send a request via the set-top box for a desired video program to be addressed from the head-end to the subscriber’s set-top box for display on the TV. Different types of VOD programs are typically bundled as a package and offered on different VOD “channels”. For example, a VOD “channel” can offer on-demand movies and videos, replay sports events, infomercials, advertisements, music videos, short-subjects, and even individual TV “pages”. VOD-based interactive television services generally allow a viewer to use the remote control to cursor through an on-screen menu and select from a variety of titles for stored video programs for individual viewing on demand. Advanced remote control units include button controls with VCR-like functions that enable the viewer to start, stop, pause, rewind, or replay a selected video program or segment. In the future, VOD-based interactive television services may be integrated with or delivered with other advanced interactive television services, such as webpage browsing, e-mail, television purchase (“t-commerce”) transactions, and multimedia delivery.

Digital cable TV is currently the most prevalent system for offering digital TV services to home TV subscribers. However, other types of digital carriers offering broadband connections to subscriber homes have entered into competition with cable TV providers by offering digital TV services over their broadband connections. Examples of other broadband connections include DSL telephone lines, local area broadband networks, and wireless broadband networks. Digital television services offered on such broadband connections employ the TCP/IP data transport protocol and are referred to as Internet Protocol Television (IPTV). Instead of multi-casting all TV program signals into a cable line, the typical IPTV system will respond to a subscriber’s request for a particular TV channel or video program by transmitting the video content individually to the subscriber’s individually addressable, digital set top box at high speeds. IPTV and digital cable TV both transmit digital video in packetized data streams within closed, proprietary broadband systems; however, IPTV uses the Internet Protocol (IP) to structure, route and deliver the digital video packets within an IPTV system.

With the increasing interactive functionality and customer reach of interactive television services, advertisers and content providers are finding it increasingly attractive to employ on-demand advertising, on-demand program content, and on-demand TV transactions for home viewers. VOD content delivery platforms are being designed to seamlessly and conveniently deliver a wide range of types of advertising, video content, and transaction services on demand to home viewers. VOD content offerings are expected to increase dramatically from a few “channels” with a few score or hundred “titles” listed on each today to scores or hundreds of channels with thousands if not millions of titles on each in the foreseeable future. The VOD platform thus offers a gateway for greatly expanding TV viewing from a relatively small number of studio-produced program channels to a large number of new commercial publishers and ultimately a vast number of self-publishers or so-called “citizen” content publishers. It is deemed desirable to find a way for such vast numbers of content publishers to transmit their programs to the home TV, and to enable home TV viewers to find something of interest for viewing among the vast numbers of new programs.

US 9,936,240 B2

3

SUMMARY OF THE INVENTION

In accordance with the present invention, a method for dynamic adjustment of an electronic program guide (EPG) for navigating to video content offered on a video-on-demand (VOD) platform of a digital TV service provider comprises:

- (a) maintaining a listing of category names for respective categories of video content to which a viewer can navigate using the EPG for the VOD platform;
- (b) tracking a viewer's past history of selections of category names for video content in the EPG and determining an order of relevance of the category names for viewer selection of video content based on said past history; and
- (c) reordering a current display listing of the category names based on said determined order of relevance.

In a preferred implementation, the order of relevance is determined in order of frequency of selection of category names based on the viewer's past history of category name selection. As an extension, order of relevance may be determined based on other parameters, such as time-of-day, weekday or weekend, or preference indicated by past selections of TV program titles. The reordered EPG display listing may list a predetermined number of category names of higher relevance, while maintaining all other category names of lower relevance out-of-sight on another display page to be accessed by activating a "More" button.

Each title is categorized within hierarchically-arranged categories and subcategories of the EPG which make up a unique hierarchical address for the title. The hierarchical address may be represented by a string of category and subcategory terms and the title delimited by standard delimiters. The hierarchical address can be shared as bookmarks the TV program with other TV subscribers or friends or contacts on the Internet.

The reordering of category names is provided by linking the viewer from a generalized EPG for all viewers on the VOD platform to a viewer-individualized EPG. The viewer-individualized EPG is accessed through a LogIn step by which the individual viewer is identified. In the LogIn step, the viewers of a subscriber household can register their names and personal identification numbers (PIN) for quick logins. The viewer-individualized EPG tracks the categories and subcategories the individual viewer clicks on and adds it to the viewer's past history. The tracking continues until the viewer logs off or the TV viewing session is ended. Besides reordering, the tracking of viewer navigation clicks and viewing preferences can be used to automatically create subcategories of TV programs of the type most frequently clicked on by the viewer, as well as for reordering in other VOD schema.

The present invention also encompasses an electronic program guide (EPG) for viewer navigation to titles for items of video content stored on a video-on-demand (VOD) platform comprising:

- (a) each item of video content being assigned a title and a hierarchical address corresponding to hierarchically-arranged categories and subcategories within which the title for the video content is to be categorized;
- (b) a listing of at least a top level of category names for respective categories of video content maintained by the EPG for the video content;
- (d) a viewer's past history of selections of category names for video content maintained in association with the EPG and used to determine an order of relevance of category names for viewer selection of video content based on said past history; and

4

- (e) a current display listing of category names for the EPG in which the category names are reordered based on said determined order of relevance.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a diagram of an overall architecture for a VOD Content Delivery System in accordance with the present invention, FIG. 1B shows an example of templated Drill-Down Ad navigation, and FIG. 1C shows an example of the templated ad display model.

FIG. 2A is a process flow diagram of the overall architecture of a Classified Ad application for the VOD Content Delivery System, FIG. 2B illustrates a Content Management Website for the Classified Ad application, FIG. 2C illustrates a Content Screening Component of the system, and FIG. 2D illustrates a Content Feed and Conversion Components of the system.

FIG. 3 is a diagram of a VOD Content Delivery System adapted to Internet Protocol TV (IPTV) system.

FIG. 4 is a diagram illustrating a process flow for enabling content publishers on the Internet to upload video content to digital television service providers for viewing on the home TV.

FIG. 5 is a diagram illustrating access to an individualized-viewer EPG for tracking a viewer's past history of selection of EPG category names and titles for reordering the EPG for faster navigation.

FIG. 6 is a diagram illustrating implementation of the reordering of EPG display listings using drill-down display templates for reordering the EPG navigation displays.

FIG. 7A is a process flow diagram of the overall architecture of an individualized-viewer EPG as a user navigates the hierarchical levels of program information. FIG. 7B is the continuation of FIG. 7A as the user navigates further into the hierarchy. FIG. 7C is a diagram illustrating the effects of usage data upon the order of content selections within the individualized-viewer-EPG display.

FIG. 8A is a diagram illustrating the recommendation to the user by the individualized-viewer-EPG system of new EPG categories based on viewer behavior. FIG. 8B is the continuation of FIG. 8A as the user navigates further into the hierarchy.

DETAILED DESCRIPTION OF INVENTION

The following description describes one preferred embodiment for implementation of the invention in which the digital television service provider is one employing cable TV infrastructure. However, it is to be understood that the principles of the invention are equally applicable to other types of digital television service providers offering digital TV services over other broadband connections such as DSL telephone lines, local area broadband networks, and wireless broadband networks. Similarly, certain examples of VOD applications are described herein, e.g., advertisements that are navigated in "drill-down" fashion, and the uploading of consumer-generated classified ads to be viewed as TV classified ads. However, many other types of video content may be used in programming with this system.

A VOD "channel" is a term commonly used for the mechanism by which users access and view VOD content. "Channel" historically refers to linear broadcast channels, and VOD by definition is a non-linear, on-demand experience. When a user accesses a VOD "channel" on a digital television system, they are accessing a digital "virtual channel", where the tuning of the channel number triggers the

US 9,936,240 B2

5

digital set top box to load and execute an interactive application that is presented on the television. This application will present the categories, subcategories and titles of VOD content that is available for viewing. The user navigates through the application using the remote control, traversing the hierarchy used to organize the VOD content. When the user selects a VOD title for playback, the digital VOD content is transmitted from a VOD server to the set top box using a dedicated data stream. The actual mechanisms for transmission vary for different digital television system technologies, but in all cases the stream is unicast to the specific set top box. The set top box receives and decodes the data stream and presents the VOD content on the television. A digital television system can support many VOD “channels”, where each “channel” is an interactive application that offers VOD content that has been grouped together by topic, sponsor, content producer or other attributes. As available bandwidth increases in digital television systems, there will be an increase in quantity of the VOD “channels” available to the user, as content producers migrate from the linear broadcast format to the non-linear on-demand format. Correspondingly, as the processing power of set top boxes increases, combined with greater network bandwidth, the sophistication of the interactive applications supporting VOD “channels” will increase, offering enhanced ways for interacting with the content and the producer, as well as offer related content and materials, transactions and other methods for engaging the user more completely with the content.

Referring to FIG. 1A, an overall system architecture for a VOD content delivery system includes a VOD Application Server **10** located at a Cable Head End. The VOD Application Server **10** manages a Database **11** of templates and video content segments from Video Server **12** for generating templated VOD content. The VOD content is generated in response to a viewer request signal transmitted from the Digital Set Top Box **21** of a viewer’s TV equipment through the Digital Cable Television System **13** to the VOD Application Server **10** at the Cable Head End. The VOD Application Server **10** may be of the type which enables any compatibly-developed VOD applications to be loaded on and operated on the server. An example of such a VOD Application Server is the Navic N-Band™ server, offered by Navic Systems, Inc., d/b/a Navic Networks, of Needham, Mass. This is an integrated system which provides an application development platform for third party application developers to develop new VOD service applications, viewer interfaces, and ancillary interactive services for deployment on VOD channels of CATV operators in cable service areas throughout the U.S. A detailed description of the Navic N-Band system is contained in U.S. Patent Application 2002/066,106, filed on May 30, 2002, which is incorporated herein by reference.

Templates for displaying VOD content are created at an Application Data Center **30** and stored in the Database **11** for use by the operative VOD application. The templates may be designed, for example, to present video ad content displays in a logo frame, or to provide navigation buttons and viewer selection options in a frame around currently displayed video content. In the preferred embodiment described in greater detail below, the templates are used to provide navigation aids in a series of progressively more focused ad display types. A Video Content Encoder **31** is used to encode raw video feeds into formatted video content segments compatible with the VOD platform and supply them through a Video Content Distribution Network **14** to the Video Server **12**.

6

In operation, the VOD Application Server **10** operates a VOD application for the CATV system, for example, “automobile infomercials on demand”. The viewer sends a request for selected VOD content, such as to see an infomercial on a specific model type made by a specific auto manufacturer, by actuating a viewer request signal by a key press on the viewer’s remote control unit transmitting an IR signal to the Set Top Box **21** that is sent on a back channel of the Digital Cable Television System **13** to the VOD Application Server **10** at the Cable Head End. In response to the signal, the VOD Application Server **10** determines the VOD content being requested and retrieves the infomercial ad display template from the Template Database **11** and video content segment from the Video Server **12**, in order to generate the corresponding templated VOD content. In the invention, the templates are of different types ordered in a hierarchy, and display of content in a template of a higher order includes links the viewer can select to content of a lower order in the hierarchy. Upon selecting a link using the remote control, the VOD Application Server **10** retrieves the template and video content of lower order and displays it to the viewer. Each successive templated display may have further links to successively lower levels of content in the hierarchy, such that the viewer can use the series of linked templated VOD displays as a “drill-down navigation” method to find specific end content of interest.

Referring to FIG. 1B, a preferred embodiment of the templated VOD content delivery system is shown providing a User Interface using Drill-Down Navigation through display ads, such as for automobile infomercials. When the viewer selects a VOD application (channel), such as “Wheels-On-Demand”, the viewer’s TV displays a Main Menu with buttons inviting the viewer to “Select Category”. The viewer can select an “Auto” category, and the TV then displays an “Auto” menu with buttons inviting the viewer to “Select Make”, such as Make A, Make B, etc. When the viewer makes a selection, such as Make A, the viewer’s TV displays a further menu that is a Gateway into templated VOD content delivery which enables Drill-Down Navigation by templated display ads. Through the Gateway, the VOD Application leaves the Menu mode and enters the Drill Down Navigation mode for successively displays of hierarchically-ordered video content which allow the viewer to navigate to progressively more focused content. In this example, the highest level of the hierarchy includes categories for Model, Local Dealer, Sales Events, and/or Inventory. When the viewer selects a category such as “Model” from the Gateway, for example, the VOD Application creates a templated ad display showing video content generic to all models by that automaker framed in a frame which has links (buttons or choices) for a list of the specific models made by that automaker. When the viewer selects the link to a specific model, “Model A” for example, the VOD Application creates a templated ad display showing video content for Model A, and the viewer can then choose to run a long-form infomercial of the Model A video. Alternatively, the Drill-Down Navigation can continue with further levels of specificity, such as “Custom Packages”, “Options”, “Colors/Stylings”, etc. Similarly, the selection of the “Local Dealer” category from the Gateway can bring up a templated ad for local dealers with links to specific local dealers in the viewer’s cable service area, and a click on a specific “Dealer A” can bring up a templated ad for Dealer A with further links to more specific content pertaining to Dealer A, such as “Current Sales Promotions”, etc.

In this manner, the templated VOD content delivery system allows the viewer to navigate to specific content of

US 9,936,240 B2

7

high interest to the viewer using the Drill-Down ads as a navigation tool, while at the same time having a unique visual experience of moving through a series of ads mirroring the viewer's path to the subject of interest. The templated VOD ads are generated dynamically by searching the Content/Template database with each request by a viewer, enabling the system to display updated navigation choices and content simply by updating the database with updated links and video content. For example, if the Auto Maker changes the Model types of autos currently available, or if Local Dealer A changes its current sales promotions for autos currently available, that advertiser's ads can be updated with new, template frame navigation links and content, instead of entirely new ads or screen displays having to be shot, produced, contracted, delivered, and programmed with the cable TV company. Many other types of layered or indepth ads, subjects, and interactive TV applications can be enabled with the use of the Drill-Down Navigation method. The selections or preferences exhibited by viewer navigation paths through the Drill-Down Navigation can also be tracked, profiled, and/or targeted as feedback data to advertisers for fine-tuning Drill-Down Navigation designs.

In FIG. 1C, an example illustrates how a templated VOD display is generated in layers. A Background screen provides a basic color, logo, or graphical theme to the display. A selected Template (display frame) appropriate to the navigation level the intended display resides on is layered on the Background. The Template typically has a frame in which defined areas are reserved for text, display image(s), and navigation links (buttons). Finally, the desired content constituted by associated Text, Image & Buttons is retrieved from the database and layered on the Template. The resulting screen display shows the combined background logo or theme, navigation frame, and text, video images, and buttons.

Referring again to FIG. 1A, a Tracking System 15 of conventional type can be installed at the Cable Head End to aggregate non-personal data on what channels and programs viewers watch. For the Drill Down Navigation method, the Tracking System 15 can include tracking of the navigation paths viewers use to find subjects of interest in a VOD Application. The aggregation of viewer navigation data can indicate what subjects are most popular, whether some subjects are of greater interest to viewers at certain times of day, of certain demographics, or in relation to certain products or services. The VOD Application Server 10 can export the aggregated viewer navigation data to an external Profiling System 16, such as a non-biased or unrelated firm applying profile analysis methods. The results of the Profiling System 16 can be communicated to a Targeting System 17, such as a template design firm or content production company, to fine-tune the presentation of the templated VOD content consistent with viewer preferences or interests. The feedback from the Targeting System can be supplied as feedback to the VOD Application Server to modify the Content/Template Database 11.

Another application for the templated VOD content delivery system can be developed to support video advertisements which link national to local market ad campaigns in "drill-down" fashion. Advertisers, both national and local, can pay for placement of their video advertisements on the system. When the VOD Application is run, the national ads are displayed as a Gateway to linking to the local market ads. In this manner, national ads can be used to transition viewers from general interest in a product to finding specific information about the product available locally.

8

The templated VOD content delivery system can also support "traffic building" videos, including music videos, that may not generate direct revenue. Once a video is encoded and registered into the system, the management and distribution of the video is conducted through software systems and automated controls. The User Interface provides the user with the ability to navigate and find desired video content. Selection of a category presents the user with a list of video titles available for playback. Categories and title lists can be generated using real-time database queries, allowing for database-driven management of content within the User Interface. The User Interface can also support a search interface which allows the user to search the video content database to generate a list of video titles with specific characteristics.

As another aspect of the present invention, a VOD content delivery system may be adapted to offer consumer-generated classified ads on TV. The VOD content delivery system is provided with a Content Management frontend to receive consumer input and convert it to video display ads maintained in the system database. Referring to FIG. 2A, a system for managing, converting and displaying individual consumer-generated ads on a VOD content delivery system has a Web-based Content Management System 40 for enabling an individual user to upload content from their computer via a web browser to display a consumer-generated video ad on TV. The uploaded content includes meta data for classifying the video ad by title and topical area(s). A Content Screening System 41 is used for screening the content input by the individual user, such as by performing automatic searching for objectionable text, audio, video and/or images and rejecting the content if found objectionable.

A Content Feed System 42 is used to automatically transfer consumer-generated content screened through the Content Screening System 41 to a Content Conversion System 43. This system automatically converts the consumer-generated content supplied by the Content Feed System 42 into video display format compatible with the VOD content delivery system. The converted video ad is indexed by title and classified topical areas according to the meta data supplied by the user, in accordance with the indexing system maintained by the Content Management System. The VOD Content Delivery System 44 operates a Classified Ads VOD Application in which menus for finding classified ads are navigated by viewers, and specific classified ads are delivered through the Digital Cable Television System for display as video ads on the viewer's TV equipment in response to viewer request input by remote control to the Digital Set Top Box 21, as described previously with respect to the operation of the general VOD platform.

Referring to FIG. 2B, the Web-based Content Management System 40 includes a plurality of functional components to allow consumers to create and manage their own classified ads as interactive television content, as well as pay for the distribution of their content within the digital cable television system. A Classified Management Application 50 is used to receive consumer-input content, have it screened (by the Content Screening System 41, not shown), and store it in the Classified Metadata, Image and Video Database 51. Consumer payment for running video ads is handled by the Transaction Processing Component 53. Also included in the Content Management System are an Account Management Component 55 and Account & Permissions Database 56 for management of user accounts for use of the web-based TV Classified Ads system. A Bulletin Board Ads application may be operated in parallel with the TV Classified Ads

US 9,936,240 B2

9

application. A Bulletin Board Management Application 54 and Database 57 enable the creation and management of consumer-generated content relating to public announcements and other items of general interest for groups, organizations or topics. The preferred VOD Content Delivery System uses templated VOD content, and a Template Library 58 is used to store templates for both the Classified Ads and Bulletin Board Ads applications.

The Account Management Component controls the access by persons to the web-based Content Management System. The Account Management Component identifies persons accessing the system for the first time and allows these persons to register and create an account by providing an account name, password, credit card information and other information required for the payment of fees. The Account Management Component controls the access by registered users to their accounts and manages the privileges and security associated to all accounts. Persons may create accounts for the creation and management of Classified Ads. Accounts capable of accessing the Bulletin Board Management Application may also be assigned by a system administrator in the Account Management Component. Any account capable of accessing the Bulletin Board application can then create and manage bulletin board ads for the assigned bulletin boards.

The Classified Content Management System enables users to upload text, audio, video, and/or image files for classified ads in industry-standard file formats and have it converted into video display ads compatible with the VOD Content Delivery System. Classified ads are searched on the viewer's TV equipment by menus and lists indexed by title and topical areas corresponding to the metadata associated with the classified ads content. Selection of a listed item results in the display of a TV display ad containing uploaded text, images, video and/or audio. Users pay listing fees to the operator of the system for maintaining and displaying the classified ads on the digital cable television system.

Significant features of the Classified Ads Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) uploading digital images of the item to the Content Management System; (c) uploading digital video of the item to the Content Management System; (d) uploading digital audio regarding the item to the Content Management System; (e) automated size and resolution processing of digital images uploaded to the system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided content; (j) ability to save classified content in persistent memory or storage for subsequent modification; (k) ability to mark classified content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when a classified content item is to become accessible by users of the interactive television system and the data and time when a classified content item is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that a specific content item is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created classified content for display on the interactive television system; (o) ability to access viewing data generated by the Tracking System regarding access and use of specific

10

consumer-generated content by users of the interactive television system; and (p) ability to calculate fees for classified content and submit payment of the fees using the Transaction Processing system.

As noted in (i) above, the Classified Content Management System allows the user to view the content they have composed using the templates. The templates are designed specifically for use on interactive television systems and the user is able to view on the web-interface their content as composed for presentation on television. As noted in (j) above, the Classified Content Management System allows the persistent storage of classified content; although the user is composing interactive television pages using a template system, the content is persistently stored as individual elements to simplify changes by the user and to allow the conversion of the content to different formats as required by different interactive television systems.

The Bulletin Board Content Management System provides the users of the web-based Content Management System with content creation and content management tools for the creation and maintenance of consumer-generated content related to announcements and other informational items of general interest. Bulletin Board content is displayed on the interactive television system as dedicated interactive television screens (bulletin boards), where approved groups, organizations or topics are each assigned a bulletin board for the display of their information. Bulletin Board content is displayed as list items organized within a bulletin board; selection of a list item results in the display of an interactive television screen containing or providing access to the descriptive data, text, images, video and audio regarding the item.

An alternative implementation of a Bulletin Board can display the content as scrolling text, where the user scrolls through the text, or the text scrolls automatically. Bulletin Board accounts will pay fees determined by the operator of the system for the distribution of the bulletin board content on the interactive television system for display on the digital cable television system. Significant features of the Bulletin Board Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) upload digital images to the content management; (c) upload digital video to the content management system; (d) upload digital audio to the content management system; (e) automated size and resolution processing of digital images uploaded to the system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided bulletin board content; (j) ability to save bulletin board content in persistent memory or storage for subsequent modification; (k) ability to mark bulletin board content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when specific bulletin board content is to become accessible by users of the interactive television system and the data and time when specific bulletin board content is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that specific bulletin board content is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created bulletin board content for display on the interactive television system; (o) ability to access viewing data generated by the

US 9,936,240 B2

11

Tracking System regarding access and use of specific bulletin board content by users of the interactive television system; and (p) ability to calculate fees for bulletin board content and submit payment of the fees in conjunction with the Transaction Processing component.

The Transaction Processing component allows users of the Classified Content Management System and Bulletin Board Content Management System to determine and pay for any fees resulting from their use of these systems. The Transaction Processing component will allow users to pay for fees using credit cards or other supported payment methods. Significant features of the Transaction Processing component include: (a) ability to maintain business rules for use by the Transaction Processing system to determine fees based on user type and content type; (b) ability to maintain business rules for one or more payment methods for use by the Transaction Processing system in handling the settlement of fees; (c) ability to maintain business rules for user account and payment settlement conditions such as delinquency and lack-of-credit for use by the Transaction Processing system in determining user account privileges and content status; and, (d) ability to process payment of fees in real-time for payment methods that support real-time settlement.

Referring to FIG. 2C, the Content Screening System (41) is comprised of a Text Screening Application 60 which searches for objectionable words or phrases, an Image Screening Application 61 which searches for objectionable graphic images, a Video Screening Application 62 which searches for objectionable images or audio words or phrases in video segments, and an Audio Screening Application 63 which searches for objectionable words or phrases in audio segments. The Content Screening System can be used for both Classified Ads content and Bulletin Board content. Content that has been screened by the Content Screening System is then transferred to the aforementioned Classified Ads Database 51 or the Bulletin Board Content Database 57. The system also has component 64 for Editorial and Customer Service Functions for Classified Ads, and component 65 similarly for Bulletin Board content. These can each include an Email Function to send confirmations of input, reasons for rejection of posting, suggested corrections, further processing, and posting of content to consumers using the system.

Significant features of the Content Screening System include: (a) ability to maintain a library of objectionable or illegal words and phrases for use in the screening of text; (b) ability to perform automated analysis of user content text using the text library as an input and alert system administration personnel to the use of objectionable or illegal content and the use of unknown and suspect words or phrases; (c) ability to maintain a library of objectionable or illegal image elements for use in the screening of images; (d) ability to perform automated image recognition analysis against user content images using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (e) ability to maintain a library of objectionable or illegal image elements for use in the screening of video; (f) ability to perform automated image recognition analysis against user content video using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (g) ability to maintain a library of objectionable or illegal audio elements for use in the screening of audio; (h) ability to perform automated audio analysis against user content audio using the library of audio elements as an input and alert system administration

12

personnel to the use of objectionable or illegal content; and (i) ability to save screened content in persistent memory or storage for subsequent processing. Content Screening is automatically performed with the Content Management System 40 during the user process of submitting and/or creating consumer-generated content or may be performed as a process subsequent to the creation of content by the user.

Referring to FIG. 2D, the Content Feed System 42 and the Content Conversion System 43 provide for the transfer of user content from the Content Screening System and conversion to video content format compatible with the VOD Content Delivery System 44. The Content Feed System 42 has a Content Selection/Date Filtering Application which selects consumer-generated content uploaded to the system that is within the dates contracted for posting and display of the content as Classified Ads or on Bulletin Boards. Content within the active date range is transferred to the Active Classified Ads Database 71A or the Active Bulletin Board Database 71B.

The Content Conversion System receives consumer-generated content in industry-standard formats or created in viewable format (HTML) on the web-based input system and converts the content into formats compatible with the VOD Content Delivery System and for display on viewers' televisions. The Content Conversion System 43 has an Image Conversion Application 72 which converts consumer-uploaded image files (in industry-standard formats such as JPEG, GIF, TIFF, BMP, PDF, PPT, etc.) into VOD content format, a Video Conversion Application 73 which converts consumer-uploaded video files into VOD content format, and an Audio Conversion Application 74 which converts consumer-uploaded audio files into VOD content format. Content converted to VOD content format is stored in the Active Converted Classified Ads Database 75A or the Active Converted Bulletin Board Database 75B. The content is subject to a further Production Push Function 76A, 76B and stored in the Production Classified Ads Database 77A or the Production Bulletin Board Database 77B, if any presentation formatting, date stamping, template framing, or other system editing is required by the system.

Significant features of the Content Feed System include: (a) ability to select user content for submission to the Content Conversion System through the testing of appropriate parameters including the date and time information contained in the user content; (b) ability to appropriately package the elements of the user content to permit the efficient transfer of these content elements to the Content Conversion System through an Application Program Interface or other interface, (c) ability to create, maintain and execute a schedule for when the Content Feed System will execute on an automatic basis for the automatic transfer of consumer-generated content to the Content Conversion System; and, (d) ability to execute the functions of the Content Feed System on a manual basis in the presence or absence of a schedule. The Content Feed System may be able to package and distribute content to single or multiple Content Conversion Systems.

Significant features of the Content Conversion system include: (a) ability to receive content packages delivered by the Content Feed System through an Application Program Interface or other interface; (b) ability to process the elements of consumer-generated content into data, text, graphic, video and audio elements that are compatible with the interactive television system and maintain the content presentation created by the user on the web-based Content Management System; (c) ability to save reformatted content in persistent memory or storage for subsequent distribution

US 9,936,240 B2

13

and use by the interactive television system; and, (d) ability to inform the interactive television system that consumer-generated content is available for distribution and use. The Content Conversion System may be added as a component system of the VOD Content Delivery System, or it may be implemented as a wholly separate system that connects to the VOD Content Delivery System through an Application Program Interface or other interface. When implemented as a system that is separate from the VOD Content Delivery System, it is possible to support multiple, different interactive television systems by either (a) incorporating multiple formatting requirements into a single instance of the Content Conversion System or (b) creating multiple Content Conversion Systems, each supporting the formatting requirements for a specific interactive television system. Either implementation allows for a single instance of consumer-generated content that is created and maintained using the web-based Content Management System to be distributed and displayed on multiple, different interactive television systems with different formatting requirements.

The VOD Content Delivery System 44, as described previously, provides for the distribution of screened, converted, properly formatted consumer-generated content to viewers' televisions, typically through the use of digital set-top boxes connected to a digital cable television system capable of supporting real-time two-way data transfer between the set-top box and the Cable Head End. Significant features of the VOD Content Delivery System include: (a) ability to receive properly formatted content from the Content Conversion System; (b) ability to distribute said content over a digital cable television system and display this content on television as an interactive television presentation; (c) ability to receive user commands generated by an infrared remote control device, keyboard or other device; (d) ability to respond to the user commands by displaying appropriate content or executing desired functionality; and, (e) ability to generate and collect data regarding the user sessions and the viewing data regarding consumer-generated content on the interactive television system and make this data accessible to the Tracking System. The VOD Content Delivery System can employ templated VOD content delivery, as described previously with respect to FIG. 1A, enabling use of the Drill Down Navigation method in which viewers can navigate visually through classified ad hierarchical categories to specific titles or content.

The VOD Content Delivery System for the Classified Ads application can also employ the Tracking System 15 for the collection and consolidation of viewing data generated by the interactive television system and the generation of reports against this viewing data. For example, the Tracking System can track the number of viewer requests for viewing that a classified ad received in a given period and calculate billing charges accordingly. The Tracking System can make this information available to users of the Content Management System as well as to system administrative personnel performing general analysis of interactive television services and associated content. Significant features of the Tracking System include: (a) ability to access and process the data generated by the Classified Ads application; (b) ability to form summaries of the viewing data against desired parameters; (c) ability to save data, summaries and reports in persistent memory or storage for subsequent modification or access; (d) ability to make data, summaries and reports accessible by users of the web-based Content Management System, restricting the data accessible by any specific user to data regarding the content created by that user account on the Content Management System; and, (e)

14

ability to make data, summaries and reports accessible by to system administration personnel.

As another aspect of the present invention, implementation of a VOD content delivery system can be made on any digital television system that supports real-time two-way data transfer and interactivity between the digital Set Top Box and application servers and VOD servers located at headends or other service points within the television system network. An alternative digital television system of increasing importance in the marketplace is Internet Protocol Television (IPTV). IPTV is a system for delivering video content, both broadcast and Video on Demand, to digital set top boxes and other devices. IPTV and digital cable both transmit digital video in packetized data streams within closed, proprietary broadband systems; however, IPTV uses Internet Protocol (IP) to structure, route and deliver the digital video packets within an IPTV system.

Referring to FIG. 3, an alternative implementation for a VOD content delivery system is illustrated for an IPTV system. The components of the VOD content delivery system listed in the figure are similar to those in FIG. 1A. However, FIG. 3 illustrates the terminology and network architecture of an IPTV system as used for the purposes of this invention. The VOD Application Server 10, Content/Template Database 11, Video Server 12 and Tracking System 15 are located in the IPTV Service Node; the IPTV Service Node is equivalent to the Cable Headend in FIG. 1A. Systems external to the IPTV Service Node such as the Application Data Center 30, Profiling System 16, Targeting System 17 and Video Content Distribution Network 14 connect to their associated VOD Content Delivery System components housed within the IPTV Service Node in manners similar to those used in a digital cable system implementation. IPTV systems can use multiple network technologies within their closed, proprietary broadband network. Core and Access Network 78 are high-bandwidth networks connecting IPTV Service Nodes in order to support the central transport of video streams. The Core and Access Network 78 feed the Customer Access Network 79, which supports the physical network connection into the customer premise and connects to the IPTV Digital Set Top Box 80. The combination of the Core and Access Network 78 and Customer Access Network 79 is the functional equivalent of the Digital Cable Television System 13 in FIG. 1A.

In operation, the VOD Content Delivery System implementation for IPTV is identical to the digital cable implementation. The VOD Application Server 10 operates a VOD application for the IPTV system, for example, "automobile infomercials on demand". The viewer sends a request for selected VOD content, such as to see an infomercial on a specific model type made by a specific auto manufacturer, by actuating a viewer request signal by a key press on the viewer's remote control unit transmitting an IR signal to the IPTV Digital Set Top Box 80 that is sent on as IP-encapsulated message through the IPTV System to the VOD Application Server 10 at the IPTV Service Node. In response to the signal, the VOD Application Server 10 determines the VOD content being requested and retrieves the infomercial ad display template from the Template Database 11 and video content segment from the Video Server 12, in order to generate the corresponding templated VOD content. In the invention, the templates are of different types ordered in a hierarchy, and display of content in a template of a higher order includes links the viewer can select to content of a lower order in the hierarchy. Upon selecting a link using the remote control, the VOD Application Server 10 retrieves the template and video content of

US 9,936,240 B2

15

lower order and displays it to the viewer. Each successive templated display may have further links to successively lower levels of content in the hierarchy, such that the viewer can use the series of linked templated VOD displays as a “drill-down navigation” method to find specific end content of interest.

Similarly, all previously mentioned adaptations of the VOD Content Delivery System implementation for digital cable, such as Classified Ads and Bulletin Boards, are supported identically on IPTV implementations. Wide Ranging Content Uploadable Via Internet to Digital TV VOD Platform

In the foregoing description, the uploading, management, conversion, and display of content uploaded from the Internet for viewing on a VOD platform was described for an embodiment in which consumer-generated classified ads and other TV-displayable information of interest are uploaded via Internet for conversion and display as video programs on cable TV infrastructure. Even further, the principles of the invention are applicable to a wide range of other content uploadable on the Internet and to other types of digital television service providers such as DSL telephone lines, local area broadband networks, and wireless broadband networks. In the following description, another exemplary embodiment of the present invention is described with respect to uploading wide ranging content via Internet for viewing on the VOD platforms of any type of digital TV system.

Referring to FIG. 4, informational/media content from any Content Source can be uploaded via Internet to a Digital TV System for placement on its Video-on-Demand (VOD) Platform to be viewable as TV programs on Viewers’ TVs by selection from an Electronic Program Guide (EPG) transmitted via the viewer’s Set Top Box for display on the TV. Content is uploaded by an author or publisher to the Web-based Content Management System 40, which processes the content through a Content Feed System 42 and Content Conversion System 43 (from standard digital data formats to TV video format) to the VOD Content Delivery System 44 where it is stored in its associated Video Content Database 45 for retrieval upon viewer request. Uploaded TV programs are offered to viewers by listing them on the EPG, and upon viewer selection via the Set Top Box, are delivered via the Digital TV System infrastructure.

For VOD platforms, an EPG is typically presented to viewers as a program guide displayed on the TV for finding a title of interest associated with that particular VOD channel. The EPG display can be pulled up using the commonly used “Guide” button on remote control units, or an “EPG” button that indicates that the set-top box supports more advanced guide navigation functions. The EPG display typically starts with a top level menu offering a vertical list or horizontal bar of broad categories of content, e.g., Movies, Documentaries, TV Shows, News, Sports, Community Events, Self-Help, Infomercials, etc. For example, the viewer can cursor through categories on a horizontal bar by using the Left/Right arrow keys on the remote control unit, and select a category by placing the cursor highlight on the desired category title, such as “News”, and clicking the “Select” key on the remote control unit. The EPG then brings up the next display of subcategories available in the selected category. For the “News” category, it might display subcategories of “ABC”, “NBC”, “CBS”, “CNN”, “MSNBC”, “Anywhere Reports”, etc. Upon selecting “Anywhere Reports”, the EPG would then display the next level of subcategories down, e.g., “San Francisco”, “Los Angeles”, “Denver”, “Dallas”, “Chicago”, “Boston”, “New

16

York”, “D.C.”, etc. This sequence continues until the viewer selects a program title or exits the EPG. In order to give the viewer a navigation experience similar to using a browser to visit pages on a website or series of websites, the EPG can be programmed to allow the viewer to cursor back to a higher category level or go forward to a lower level previously traversed by pressing the Up/Down arrow keys. Similarly, after the viewer has viewed a selected TV program, pressing the “EPG” button again returns the viewer to the position of the title in the EPG. The EPG display can also provide visual traces or “breadcrumbs” of the categories and subcategories traversed by the viewer to that title by displaying the hierarchical addressing sequence on a top or lower border of the TV display.

The EPGs for VOD “channels” thus use program guide displays on the TV which are in a structured hierarchy to allow the viewer to navigate to a program title of interest. Upon selecting the title, a data return associated with that title is sent from the set-top box as a request to the VOD platform for the program associated with that title. The EPG database of the VOD platform maintains an index linking the program titles to the addresses in the VOD Content Database 45 where the respective programs are stored. Upon receiving a request of a program title from the set-top box, the VOD Content Delivery System 40 retrieves the corresponding video content from the Database and transmits it on its broadband network to the set-top box that sent the request. Advanced VOD platforms also have VCR or DVR-like functions that enable a viewer to Pause, Play, Rewind, Fast Forward, and Stop a program using the TV remote control unit.

Hierarchical Addressing of TV Programs

In the present invention, the EPG hierarchical display structure used in VOD platforms is used as a form of “hierarchical addressing” that uniquely allows viewer navigation to and identifies a program title of interest. This EPG hierarchical addressing scheme can be represented as a string of category term, subcategory term(s), and title that together (as a string delimited by standard character delimiters) uniquely identifying each program offered on the EPG channel. In FIG. 4, for example, the EPG address for a program title on the VOD channel might be represented with a TV (EPG) address as:

TV: /News/Anywhere Reporting/New York/Financial/“Live from NYSE by Jim Cramer”

The uploaded content may be of any digital media type and come from any web-based source. For the TV viewing environment, content accompanied by video images and voice and/or sound is preferred for presentation as entertainment or recreational viewing. Such content can be generated ubiquitously from any PC computer by an author or publisher using a video or webcam for images and a microphone for audio. The media streams may be edited and composed with a multimedia program, such as Microsoft Windows™ Media, Apple Quicktime™, Macromedia Flash™, and others. Similarly, the content may already be composed as a video program and posted on a website as a downloadable video program via a web link or publishing point address. For example, websites like YouTube.com, Brightcove.com, and others have become very popular by offering thousands of self-published video programs by nonprofessional authors and publishers for viewing on the Internet. Such video content may also be uploaded from digital media devices such as iPod™ Video sold by Apple Computer Corp. on which it has already been downloaded from a website. It may also be uploaded from digital phone

US 9,936,240 B2

17

devices such as iPhone™ sold by Apple which has an on-board camera for video and microphone for sound.

The term “Internet” is intended to include any wide area digital network or network of networks connecting a universe of users via a common or industry-standard (TCP/IP) protocol. Users having a connection to the Internet commonly connect browsers on their computing terminal or device to websites that provide informational content via web servers. The Internet can also be connected to other networks using different data handling protocols through a gateway or system interface, such as wireless gateways using the industry-standard Wireless Application Protocol (WAP) to connect Internet websites to wireless data networks. Wireless data networks are being deployed worldwide and allow users anywhere to connect to the Internet via wireless data devices.

The Digital TV System in FIG. 4 can be of any type that supports video-on-demand programming to TV viewers on any suitable type of VOD platform (infrastructure). While it may be a Cable TV system as described previously, it may be any type of digital TV system providing TV services via a high-speed data connection to the viewer's TV. For example, it may be an Internet Protocol TV (IPTV) system of the type connected to home subscribers via phone DSL lines, cable or other high-speed, high-bitrate connections. As previously described with respect to FIG. 3, the IPTV system can support video-on-demand TV services to TV viewers on a scale that cannot be supported by Internet video websites. The Internet is not an infinitely scalable resource, and placing a burden such as high-bitrate, high definition, full-screen video streams in any significant volume can overwhelm the Internet in its present form. IPTV transmits video programs in digital format using the IP protocol, but instead of transmitting over common Internet connections, it transmits over high-speed, high-bitrate connections that are envisioned to be implemented ultimately as all-fiber optical “last mile” connection to the home.

In the present invention, content can be uploaded via the Internet to the Web-based Content Management System 40 of a Digital TV System and automatically converted, navigated and selected/displayed on the VOD platform for viewing on home TV. Automatic navigation, selection and display is enabled by adopting the same EPG hierarchical addressing scheme used for the VOD program guide as the addressing metadata identifying content uploaded on the Internet. When an author or publisher connects to the Web-based Content Management System 40, the author or publisher selects the category term, subcategory term(s) and title by which it is desired to find the program title in the TV EPG display hierarchy. Thus, when the above-mentioned example of a video program is uploaded, the hierarchical address for that program would be selected as:

TV: /News/Anywhere Reporting/New York/Financial/“Live from NYSE by Jim Cramer”.

This hierarchical addressing metadata is associated with or tagged to the content when uploaded to the Web-based Content Management System 40, and is carried over into the VOD/EPG navigation scheme displayed on the TV. Hierarchical addressing is already well familiar to computer users through the hierarchical ordering of files stored in layers of folders on computers. By carrying over the hierarchical address metadata into EPG navigation, the invention allows the content to be automatically listed in the EPG under a common addressing scheme to enable viewers to find any program of interest. The hierarchical addressing string of terms also resembles URL addressing sequences commonly used on the Internet. Thus, Internet users can readily become

18

familiar with finding TV programs on the VOD EPG guide due to its resemblance to finding web resources with a URL. Indeed, in the convergence of Internet and TV worlds, a TV EPG hierarchical address may be thought of as a URL for a TV program.

The uploaded content is converted, as previously described, into a standard TV digital format, and a “local instance” thereof is stored at an assigned VID address in the Video Content Database 45 of the VOD platform. The VID address is linked to the metadata title for the video content listed in the EPG. The hierarchical address for the title is automatically carried over into the EPG navigation scheme, and can be found by a viewer cursoring (with the TV remote control) through the EPG following the same hierarchical addressing sequence. Upon the subscriber selecting, via a remote control unit in communication with the set-top box, the title of the video content from the hierarchically-arranged categories and subcategories in the EPG, a return request for the selected title is transmitted to the VOD platform for retrieving the video content at the linked VID address in the Video Content Database. The requested video program is then retrieved and transmitted by the VOD Content Delivery System 44 through the digital TV lines to the subscriber's set-top box for display on the subscriber's TV.

By the method of the present invention, the title and hierarchical address assigned by the publisher of the program is automatically carried over into the TV electronic program guide (EPG) following the same hierarchical addressing indicated by the publisher of the content. The publisher selects categories and subcategories for categorizing the title of the video content from the EPG categorization scheme presented by the digital television service provider for the listing of titles on one of its VOD channels. With this method, vast numbers of content publishers anywhere on the Internet can upload their programs with a minimum of conversion and handling steps by the digital television service provider. Home TV viewers can then easily use the EPG hierarchical navigation scheme to find something of interest for viewing.

As more and more video content becomes offered on VOD platforms of digital TV systems, it may be desirable to enable more robust functionality for the EPG including the capability to bookmark TV programs and share TV bookmarks with other TV subscribers or even friends and contacts on the Internet. Bookmarking can be implemented by using the hierarchical address as the unique address for identifying an item of interest on the VOD platform. Such a system is disclosed in a concurrent continuation-in-part U.S. patent application Ser. No. 11/685,188 by the same inventor, filed on Mar. 12, 2007, entitled “Converting, Navigating and Displaying Video Content Uploaded from the Internet to a Digital TV Video-on-Demand Platform”, which is incorporated herein by reference.

The extension of TV VOD programming to citizen publishing, and the convergence of Internet searching with sharing of TV program bookmarks, can also stimulate diverse new content publishing sources and supporting hardware and equipment in the converged Internet-TV universe. For example, TV EPGs can be exported via Internet to Internet-connected digital devices, including digital phones, media players, game consoles, Video iPods™, PDAs, etc., and conversely, TV bookmarks selected from EPGs on the Internet can be imported back into the viewer's “MyEPG” or “MyVideoLibrary” for their TV through the Web-based Content Management System. This would enable people to freely select, save, bookmark, and share TV

US 9,936,240 B2

19

programs with friends and contacts between their TV viewing environment and their daily mobile or away-from-home environments. Internet-connected DVRs, such as those sold by TiVo, or virtual DVRs offered by the digital TV service provider can also connect Internet searching and bookmark sharing to the viewer's "MyEPG" or "MyVideoLibrary" for VOD program viewing.

Going from Internet to the TV, a PC user can share TV bookmarks received by email on the PC with other contacts and friends whose email addresses are maintained in an address book or contact list on that person's email client. The PC user can also send TV bookmarks found in searching a website for program listings offered by the Digital TV System to their own Viewer Bookmarks filed(s) or to those of other TV subscribers. The PC user simply logs on via Internet to the Web-based Content Management Server 40 for the Digital TV System and selects an option to send the TV bookmark(s) to the Viewer's Bookmark file(s) for that person's subscriber name/user, or to the name/user of any other TV subscriber.

Dynamic Adjustment of EPG Displays for Faster Viewer Navigation

As more and more video content becomes offered on VOD platforms of digital TV systems, it would be desirable to dynamically adjust the EPG displays listing the categories, subcategories, and titles of TV programs in a manner to minimize the number of keypresses on the remote control unit needed to navigate to a program title of interest. In the present invention, the viewer's past history of EPG navigation and TV program selection are tracked, and the ordering of categories, subcategories and/or titles displayed in the EPG is dynamically reordered in accordance with higher relevance to the viewer. In the following description, a preferred implementation of dynamic adjustment of the EPG tracks the frequency of the viewer's selection of categories, subcategories, and titles, and reorders them in the viewer's EPG (MyEPG) for faster navigation is described.

Referring to FIG. 5, a diagram illustrates in Step 501 a typical display of an EPG for a VOD channel. The top level display of the EPG has a vertical listing (or horizontal bar) showing the names of broad categories for the TV programs offered for viewing on demand. In this example, the vertical listing lists: "Movies"; "Documentaries"; "Short Subjects"; "News"; "Sports"; "Public Interest"; and "Infomercials" in top to bottom order. In this embodiment, a button for "MyEPG" is also offered to link the viewer to a viewer-individualized EPG.

Upon pressing the "MyEPG" button in Step 501, the viewer is taken to Step 502 in which the first Login display shows a list of previously registered viewers in the household subscribed to the digital TV service. For example, in this household, two viewers "Diaz-Perez, A" and "Diaz-Perez, M" were previously registered. If the viewer selects one of the previously registered names, the display also prompts the viewer for entry of their selected personal identification number (PIN). If the current viewer wishes to register as a new viewer in the household, the Login display offers the option of entering a new viewer name and PIN using the remote control unit for character spelling (numeric pad style). Upon selecting or entering the viewer name and PIN, the viewer then presses the button for "Go To MyEPG".

The viewer is then taken to Step 503, where the top level display of MyEPG shows a vertical listing of names of the broad categories for the TV programs offered for viewing on demand. However, in this example, the vertical listing has been reordered to list from top to bottom those categories in

20

order of frequency with which the viewer has clicked on them in the past, e.g., "Public Interest", "Documentaries", "Short Subjects", "Sports", "News", "Movies", and "Infomercials". Therefore, this viewer who has previously visited the "Public Interest" category most frequently now only needs to click the "Select" button to link to the next level of MyEPG display. The viewer who has previously visited the "Documentaries" category second most frequently only needs to cursor down (arrow key) one click to highlight the "Documentaries" category then press the "Select" button, and so on. In a similar manner, subcategories listed on the next level of MyEPG display are reordered in order of frequency of this individual viewer's past navigation clicks, and so on to lower subcategories and finally to individual titles of TV programs.

If the VOD channel has too numerous category names or titles to list on any given MyEPG display level, it can also reorder the display by listing, say, the top 7 category names or titles as a suitable number of displayed choices, and all other category names or titles of lower relevance out-of-sight on a following page accessed by clicking the "More" button.

In this manner navigating through many options at each level of EPG display can be made faster for the individual viewer in MyEPG. Once the viewer identifies him/herself to the VOD system by logging in to MyEPG, the system tracks all EPG navigation clicks as being those of that viewer until the TV session ends or another viewer in the same household logs in. As a basic tracking method, the system tracks which categories and subcategories the viewer clicks on most frequently, then reorders the EPG nav listing/bar to display those listed first.

As a preferred form of implementation of MyEPG reordering, the system can employ the hierarchical, templated approach to "drill down" navigation to VOD items of interest as previously described with respect to advertising in FIGS. 1B and 1C. To illustrate, in FIG. 6, the drill-down navigation in MyEPG can proceed from a top category level display in 601, to selection of a next subcategory level display 602, to selection of a further subcategory level display 603, and finally the titles display 604, all of which have the category and subcategory names and titles reordered in highest priority for those most frequently clicked by the viewer. Instead of cursoring through the list, the options may also be listed indexed to numbers which can be selected by one keypress of the corresponding number on the remote control unit.

Referring to FIG. 7A, an overall system architecture for a MyEPG system includes the MyEPG Server 702 located at or connected to a digital television system Head End. The MyEPG Server 702 processes any requests from the viewer for MyEPG information to be displayed within the MyEPG display templates. In the first illustration in FIG. 7A, the viewer has logged into the MyEPG system, and the MyEPG application needs the proper content categories to populate the MyEPG Main Menu 701. A request for this information is sent to the MyEPG Server 702 upon performing the login. To process the request, the MyEPG Server 702 receives information regarding the viewer from the User Profile database 704. The User Profile information can include programming preferences stated by the viewer, demographic information (such as age, gender, income, geographic region, etc.) and other descriptive information that may be useful to the relevance algorithms of the MyEPG Server 702. The MyEPG Server 702 also obtains information regarding the actual viewing habits of the viewer from the Usage History database 703. The Usage History database

US 9,936,240 B2

21

703 is updated whenever the viewer accesses programming content, providing a detailed log of the viewer's consumption of programming content. The MyEPG Server 702 uses the information from Usage History 703 and User Profile 704 to form a relevance schema by which to rank and order the programming data provided by the EPG Data/Metadata database 705. This newly reordered EPG data is packaged into a MyEPG Query Result Set 706 and delivered to the MyEPG application for display to the viewer, using the MyEPG templates. In the MyEPG Main Menu 701, the viewer is presented with a list of categories in order of relevance to the viewer as determined by their viewing habits.

Continuing in FIG. 7A, the viewer has reviewed the programming categories displayed in the MyEPG Main Menu 701 and selects the category "SPORTS". Upon selecting "SPORTS", the Usage History database 703 is updated to reflect this MyEPG selection by the viewer. Similar to the processing for the MyEPG Main Menu 701, a request is generated to the MyEPG Server 702 for a listing of the programming subcategories for "SPORTS". Using the information from the Usage History database 703 and the User Profile 704, the MyEPG Server 702 selects and sorts the subcategories for the Sports category, packages this newly ordered EPG data in the MyEPG Query Result Set 706 and delivers it to the MyEPG application for display as the MyEPG Sports Category Menu 707.

Continuing in FIG. 7B, after reviewing the programming subcategories displayed in the MyEPG Sports Menu 707, the viewer continues traversing the hierarchy of the MyEPG data and selects the subcategory "HORSE RACING". Upon selecting "HORSE RACING", the Usage History database 703 is updated to reflect this MyEPG selection by the viewer. Similar to the process described in FIG. 7A, a request is generated to the MyEPG Server 702 for a listing of the programming sub-sub-categories for "HORSE RACING". Using the information from the Usage History database 703 and the User Profile 704, the MyEPG Server 702 selects and sorts the sub-sub-categories for the Horseracing subcategory, packages this newly ordered EPG data in the MyEPG Query Result Set 706 and delivers it to the MyEPG application for display as the Horseracing subcategory 708.

Continuing in FIG. 7B, after reviewing the programming sub-sub-categories displayed in the MyEPG Horseracing Menu 708, the viewer continues traversing the hierarchy of the MyEPG data and selects the sub-sub-category "GOLDEN GATE FIELDS". Upon selecting "GOLDEN GATE FIELDS", the Usage History database 703 is updated to reflect this MyEPG selection by the viewer. Similarly to the process described for FIG. 7A and FIG. 7B, a request is generated to the MyEPG Server 702 for a listing of the program titles for "GOLDEN GATE FIELDS" sub-subcategory. Using the information from the Usage History database 703 and the User Profile 704, the MyEPG Server 702 selects and sorts the program titles for the Golden Gate Fields sub-subcategory, packages this newly ordered EPG data in the MyEPG Query Result Set 706 and delivers it to the MyEPG application for display as the MyEPG Golden Gate Fields sub-sub-category 709.

To arrive at the MyEPG Golden Gate Fields Menu 709, the viewer has traversed four levels of hierarchy within the MyEPG system, using a single processing system to handle the queries and responses required by the MyEPG application as the viewer navigates through the MyEPG templates. The hierarchical, templated nature of the MyEPG system supports this uniform methodology for handling any number of levels in content hierarchy.

22

Continuing in FIG. 7C, after reviewing the program titles displayed in the MyEPG Golden Gate Fields Menu 709, the viewer returns to the MyEPG Main Menu by selecting the "MyEPG" button on the display. Upon selecting "MyEPG", the Usage History database 703 is updated to reflect this selection by the viewer. Similarly to the process described in FIG. 7A, a request is generated to the MyEPG Server 702 for a listing of the Main Menu categories. Using the information from the Usage History database 703 and the User Profile 704, the MyEPG Server 702 selects and sorts the Main Menu categories, packages this newly ordered EPG data in the MyEPG Query Result Set 706 and delivers it to the MyEPG application for display as the MyEPG Main Menu 710. The MyEPG Main Menu 710 differs from the MyEPG Main Menu 701 in shown in FIG. 7A as a result of new usage information that affects the determination of relevance. The viewer's activity now indicates that the SPORTS category is now the mostly frequently accessed category and generates the most selections of actual programming content. In FIG. 7A, the MyEPG Main Menu 701 had "NEWS" as the first-ranked category; in the FIG. 7C, the MyEPG Server 702 has determined that "SPORTS" is the top-ranked category, and has reordered the MyEPG Main Menu listings accordingly. Similarly, if the viewer selects "SPORTS", the Sports subpage will display "HORSE RACING" at the top of the MyEPG listing, and "GOLDEN GATE FIELDS" at the top of the Horseracing subpage. However, the Golden Gate Fields subpage will list the then current days' races because those titles will have changed with current race video content uploading. To conclude the MyEPG session, the viewer selects "EXIT MyEPG" from the MyEPG Main Menu 710 and exits the MyEPG application.

As an extension to the MyEPG reordering process, the system can also employ viewer preference algorithms and determine a likely reordering of the category names and titles based on more sophisticated criteria, such as time-of-day, weekday or weekend, or even preferences based on past selections of TV program titles. For example, if the viewer frequently views episodes of the TV show "Columbo", the system can reorder titles displayed at the TV program selection level to list any newly available "Columbo" episodes at the top of the MyEPG display, or if very frequently watched, it can automatically create a category or subcategory as the next higher navigation level to list all the available "Columbo" titles.

Referring to FIG. 8A, the creation by the MyEPG system of a new category based on past selections of TV program titles is illustrated. When the MyEPG system detects a usage pattern that could warrant the creation of a new category, the MyEPG system informs the viewer of the recommendation. The MyEPG Main Menu 801 displays the "NEW CATEGORY SUGGESTIONS" menu item. When the viewer selects the "NEW CATEGORY SUGGESTIONS" menu item, they are taken to the MyEPG New Category Suggestions menu 802. This menu lists the content categories that the MyEPG system has determined could further individualize the viewer's MyEPG display and simplify the viewer's ability to access content of significant interest. In this example, the MyEPG New Category Suggestions menu 802 lists the television series "Columbo" as a new category recommendation based on viewing habits. Continuing to FIG. 8B, the viewer selects "Columbo" and is taken to the MyEPG New Category Confirmation menu 803. This menu allows the viewer to accept or reject the new category recommendation. By accepting the recommendation, the MyEPG system will insert the new category in the appro-

US 9,936,240 B2

23

priate location within the viewer's MyEPG display, as determined by relevance and hierarchy. The MyEPG Main Menu **804** shows the Main Menu with the new "COLUMBO" category, ranked second in terms of relevance to the viewer. Accessing the "COLUMBO" category would take the viewer to a listing of "Columbo" episodes that are available for viewing.

As the viewer navigation traverses through the hierarchically-arranged categories and subcategories down to individual titles for individual items of video content, the hierarchical arrangement of categories and subcategories is indicative of a unique hierarchical address for the item of video content. As previously described with respect to FIG. 4, the hierarchical address may be represented as a string of category and subcategory terms and the title delimited by standard delimiters, and used to implement a bookmarking function by which viewers can share TV bookmarks with other TV subscribers or even friends and contacts on the Internet.

The reordering of frequently selected options can also be applied to any VOD navigation schema where the viewer's experience could be enhanced by reordering the presentation layer data within the hierarchical model to suit the preferences of the viewer. For example, dynamic reordering could be applied to a navigation tree for on-demand TV programs for a specific product area of interest, such as "Autos", to order the listed product infomercials or ad information displays based on the viewer's past history of preferences.

It is understood that many modifications and variations may be devised given the above description of the principles of the invention. It is intended that all such modifications and variations be considered as within the spirit and scope of this invention, as defined in the following claims.

The invention claimed is:

1. A method comprising:

- (a) providing, to a first Internet-connected digital device, a viewer interface application configured to access a digital television service provider system to obtain video-on-demand electronic media content and broadcast video content corresponding to a broadcast television channel,

wherein the video-on-demand electronic media content is obtained from a VOD content delivery system of the digital television service provider system that has obtained the video-on-demand electronic media content and respective VOD metadata associated with the video-on-demand electronic media content, the respective VOD metadata comprising respective title data and respective category data, and

wherein the viewer interface application is further configured to provide access to an individualized electronic program guide for at least video-on-demand electronic media content based at least in part on electronic viewing data for a first user and VOD metadata;

- (b) transmitting, to a set-top box using IP protocol associated with the first user, first broadcast video content for viewing on a first display associated with the set-top box using IP protocol;
- (c) receiving, at the digital television service provider system via a IPTV delivery system from the set-top box using IP protocol, a first electronic access request to access video-on-demand electronic media content;
- (d) accessing, at the digital television service provider system upon receipt of the first electronic access request, a first individualized electronic program guide data for video-on-demand electronic media content

24

wherein the first individualized electronic program guide data is generated by:

- (i) accessing, at the digital television service provider system from one or more non-transitory processor readable memory devices operatively connected to the digital television service provider system, first electronic viewing data associated with the first user; and
- (ii) generating, at the digital television service provider system, the first individualized electronic program guide data for video-on-demand electronic media content, based at least in part
 - (1) on the first electronic viewing data, and
 - (2) the VOD metadata;
- (e) transmitting, from the digital television service provider system to the set-top box using IP protocol, the first individualized electronic program guide data for populating a first set of one or more templates associated with a first individualized electronic program guide in response to the first electronic access request;
- (f) receiving, at the digital television service provider system from the set-top box using IP protocol, a first VOD media request for a first video-on-demand electronic media content;
- (g) updating, by the digital television service provider system, the first electronic viewing data with information associated with the first VOD media request to generate second electronic viewing data;
- (h) transmitting, from the digital television service provider system via the IPTV delivery system to the set-top box using IP protocol, the first video-on-demand electronic media content identified in the first VOD media request for display on the first display associated with the set-top box using IP protocol;
- (i) receiving, at the digital television service provider system from the first Internet-connected digital device, login credentials;
- (j) verifying, by the digital television service provider system, that the login credentials are associated with a user account;
- (k) transmitting, to the first Internet-connected digital device, an electronic authorization for the viewer interface application to access privileges associated with the user account;
- (l) receiving, at the digital television service provider system via a broadband connection from the first Internet-connected digital device, a second electronic access request to access video-on-demand electronic media content;
- (m) transmitting, from the digital television service provider system to the first Internet-connected digital device via the broadband connection, a second individualized electronic program guide data for populating a second set of one or more templates associated with a second individualized electronic program guide for video-on-demand electronic media content, wherein the second individualized electronic program guide data is generated based at least in part upon
 - (1) the second electronic viewing data, and
 - (2) the VOD metadata;
- (n) receiving, at the digital television service provider system via the broadband connection from the first Internet-connected digital device, a second VOD media request for a second video-on-demand electronic media content;
- (o) updating, by the digital television service provider system, the second electronic viewing data with infor-

US 9,936,240 B2

25

mation associated with the second VOD media request to generate third electronic viewing data; and

(p) transmitting, from the digital television service provider system via the broadband connection to the first Internet-connected digital device, the second video-on-demand electronic media content identified in the second VOD media request for display on a second display associated with the first Internet-connected digital device.

2. The method of claim 1, wherein the method further comprises the steps of:

(q) receiving, at the digital television service provider system via the broadband connection from a second Internet-connected digital device associated with the first user, a third electronic access request to access video-on-demand electronic media content;

(r) generating, by the digital television service provider system, a third individualized electronic program guide data based at least in part upon

(1) the third electronic viewing data and,

(2) the VOD metadata to be sent to the second Internet-connected digital device in response to the third electronic access request;

(s) transmitting, from the digital television service provider system to the second Internet-connected digital device, the third individualized electronic program guide data for populating a third set of one or more templates associated with a third individualized electronic program guide;

(t) receiving, at the digital television service provider system via the broadband connection from the second Internet-connected digital device, a third VOD media request for a third video-on-demand electronic media content;

(u) updating, by the digital television service provider system, the third electronic viewing data with information associated with the third VOD media request to generate fourth electronic viewing data; and

(v) transmitting, from the digital television service provider system via the broadband connection to the second Internet-connected digital device, the third video-on-demand electronic media content identified in

26

the third VOD media request for display on a third display associated with the second Internet-connected digital device.

3. The method of claim 1, wherein the first video-on-demand electronic media content is a television show.

4. The method of claim 1, wherein the first video-on-demand electronic media content is a movie.

5. The method of claim 1, wherein the first video-on-demand electronic media content is a documentary.

6. The method of claim 1, wherein the first video-on-demand electronic media content is a short subject.

7. The method of claim 1, wherein the first video-on-demand electronic media content is a news program.

8. The method of claim 1, wherein the first user includes a number of different persons associated with the user account of the first user, and wherein the first and second individualized electronic program guides are generated on an individualized basis for each of the number of different persons associated with the user account.

9. The method of claim 1, wherein the first Internet-connected digital device is a digital phone.

10. The method of claim 1, wherein the first Internet-connected digital device is a computer.

11. The method of claim 1, wherein the first Internet-connected digital device is a game console.

12. The method of claim 1, wherein the first individualized electronic program guide is ordered by categories, and wherein the step of generating the second individualized electronic program guide comprises reordering at least one of the categories of the first individualized electronic program guide.

13. The method of claim 2, wherein the second individualized electronic program guide is ordered by categories, and wherein the step of generating the third individualized electronic program guide comprises reordering at least one of the categories of the second individualized electronic program guide.

14. The method of claim 1, wherein the broadband connection comprises a local area broadband network.

15. The method of claim 1, wherein the broadband connection comprises a wireless area broadband network.

* * * * *